Information Governance

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The Sailor's Knot. A knot used to fasten two cables or hawsers together. Also called the Carrick Bend or Full Carrick Bend. It's easy to tie, does not slip easily in the wet, and is among the strongest of knots - it does not jam and is easily untied. First used by Celtic mariners, and inspired Celtic art. Origin: *Carrack*, a large galleon used in the 14th, 15th, and 16th centuries. Middle English *carike*, from Medieval Latin *carrica*, from French *caraque*, from Spanish *carraca*, from Greek *kerkouros*, meaning fast light vessel (American Heritage Dictionary, 2000).

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Information Governance

An Empirical Investigation of the Differentiation and Integration of Decision Making for Information Technology in Financial Services

Proefschrift

Ter verkrijging van de graad van doctor aan de Katholieke Universiteit Brabant,
op gezag van rector magnificus, prof. dr. F.A. van der Duyn Schouten,
in het openbaar te verdedigen ten overstaan van een door het college voor promoties
aangewezen commissie in de aula van de Universiteit op
vrijdag 12 april 2002 om 14:15 uur

door

Ryan Romeo Peterson,
geboren op 26 februari 1973 te Aruba

In memory of my grandfather, Wilbert F. Peterson

Although ships are large and are driven by strong winds,
they are directed through the art of steersmanship
(James 3:3-5)

Acknowledgements

While the original thought to pursue a Doctorate degree in Philosophy dates back to 1993, the idea for this study was conceived on a cold, yet sunny afternoon in January of 1998. During a lengthy discussion on strategic questions and challenges regarding the organization and management of Information Technology in contemporary organizations, the subject of governance stealthily surfaced into the conversation. Little did I know then that Information Governance would be the leading title of my dissertation, and "like all young men I set out to be a genius, but mercifully laughter intervened"*.

In somewhat similar fashion, Information Governance found its way onto the strategic agenda of business enterprises and research institutes, both posing a deceptively simple question: how should Information Technology be governed in order to provide direction and realize business value? At present, half-a-century after their first acquaintance with Information Technology, organizations are still struggling with the answers to this question, as I have during these last years. I do not presume to have all the answers, but as James Thurber so eloquently points out, "it is better to ask and answer some questions, than to ask none, and presume to know all the answers"*.

During the past four years, I visited many places and met many people, each of whom contributed in their own special way to the realization of this study. First and foremost, I wish to thank God, who graced me with wisdom, patience and perseverance.

I would like to express my respectful gratitude to the organizations that participated in this study, and to all of the executives who took the time and effort to share their thoughts and insights with me. They provided me with the valuable - often confidential and sensitive - data and information required. Without their involvement and support this study would not have been possible.

I am grateful to my supervisors, Ramon O'Callaghan and Pieter Ribbers, for sharing their knowledge and experiences with me. Their guidance throughout the past four years has proven to be more than valuable. I would like to thank the committee members for their time and effort in commenting and evaluating the dissertation. I would also like to thank Chris Vissers who offered me the opportunity to pursue my research career. I owe a debt of gratitude to Dirk de Wit, who thought me the political finesse of research, and encouraged me never to let go of my research instincts.

To the ICIS Doctoral Class of '98, thank you for the inspiration and fun. To Leo, thanks for the 'finishing touch'. I would also like to thank my colleagues and (ex-) students at the Departments of Information Management, International Business, and TIAS Business School for their inquisitiveness and interesting discussions regarding this study.

Saving the best for last, I would like to thank my wife Léonie for her companionship on this long and sometimes stormy journey. Whether upstream or downstream, come white-water or low tides, together we will conquer the seas. Like a ship in port, your love I will always harbor.

This thesis is dedicated to my grandfather. He taught me the art and craft of steersmanship, and after twenty years, I think I finally appreciate what he meant by 'use the markers and find the catch'. I hope that you will also use your markers to find your catch. Thank you.

Ryan R. Peterson

The Netherlands, 2001

* Lawrence Durrell (1971)
* James Thurber (1962)

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Chapter 1: Introduction

Tell me, O Muse, of that ingenious hero who traveled far and wide after he had sacked the famous town of Troy. Many cities did he visit, and many were the nations with whose manners and customs he was acquainted; Tell me about all these things, O daughter of Jove, from whatsoever source you may know them – The Odyssey

1.1 Contemporary Environments & Changing Imperatives

The turn of a century conveniently punctuates history, marking the end of a previous era and inspiring new visions for the future. For academics and executives alike, the end of the twentieth century witnessed an extraordinary fascination with information technology (IT) and business transformation. Heralded as the digital economy (Tapscott, 1996), the network economy (Kelly, 1999) or the electronic economy (El Sawy et al., 1999), the excitement and expectations regarding the strategic potential of IT to create new electronic business environments[1] have never been greater. While the importance of IT is well recognized (Scott Morton, 1991; Luftman, 1996; Willcocks et al., 1997), and organizations are increasingly conducting their business transactions across electronic networks (Jones et al., 2000), studies suggest that organizations are experiencing difficulty in leveraging IT (Hartman & Sifonis, 2000; Remenyi et al., 2000; Venkatraman, 2000; Weill & Broadbent, 2000). Anecdotal evidence indicates that less than 5% of companies have fully operational electronic business networks (CSC, 2001).

The fascination and challenges associated with electronic business environments coincides with an increasing turbulent and competitive business landscape, in which the intensity, unpredictability and diversity of change accelerates to create a condition of constant flux (D'Aveni, 1994). The changes in markets and technology are so rapid and discontinuous, that information is often inaccurate or obsolete (Eisenhardt, 1999). D'Aveni (1994) metaphorically describes the contemporary business environment as 'hypercompetitive'. This hypercompetitive environment is characterized by, e.g. (D'Aveni, 1999; El Sawy et al., 1999; Galbraith & Lawler, 1993; Hitt et al., 1998):

(a) Time and cost compression in product-life and design cycles;
(b) Accelerating technological advancements;
(c) Fickle customer loyalty;
(d) Tailored, knowledge-intensive solutions;
(e) Unexpected entry by new competitors, and repositioning of incumbents;
(f) Redefinition of industry and organizational boundaries, and;
(g) Lingering economic growth.

Many of these developments are - individually - not new[2]. However, as the mosaic of these developments transpires simultaneously in unpredictable patterns, organizations face significant uncertainty and ambiguity in strategic decision-making. Research indicates that these developments are posing challenges to many organizations (Figure 1.1), and conventional business propositions for value creation are challenged. There is no stable competitive position, bureaucratic hierarchies become a competitive liability, core competencies develop into core rigidities, and strategic fit is fleeting

[1] Electronic business environments are interpreted as an operating style in which business activities and transactions are based, and critically dependent upon IT, in order to operate efficiently, effectively, adaptively (Jones et al., 2000; Markus, 2000).
[2] It is worth noting that over the past decades different studies (e.g., Emery & Trist, 1965; Lawrence & Lorsch, 1967; Toffler, 1970; Ansoff, 1984; Eisenhardt, 1989; Quinn, 1992; D'Aveni, 1994) discussed the increasing turbulent and competitive business environment, and the requisite organizational capabilities for attending to these environments.

(Boynton, 1993; Cooper, 1995; D'Aveni, 1999; Hitt et al., 1998; Treacy & Wiersema, 1998; Weill & Broadbent, 1998). Under these conditions, organizations attempt to meet competing, traditionally regarded as conflicting, demands to (Boynton, 1993):

(a) Deliver customized, high quality products and services;
(b) Compress costs and time in order to market products efficiently and effectively;
(c) Develop and share (intra-/inter-) organizational expertise.

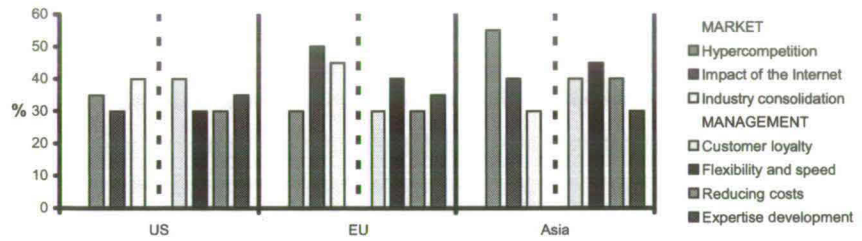

Figure 1.1. Marketplace developments and management challenges according to CEOs across the US, Europe and Asia[3] (The Conference Board & Accenture, 2000).

Confronted by these competing demands, organizations differentiate and develop a repertoire of competencies to respond to, and influence their external environment (Hitt et al., 1998). As explained by Ashby (1956), in order to respond to all circumstances, an organization should have a variety of capabilities at least as great as the demands and disturbances in the environment. The interface with a changing environment demands responsiveness and adaptability. Yet, continuous differentiation leads to fragmentation, unless a corresponding process of integration complements it. The uncertainty and ambiguity associated with the complex of external demands and differentiated capabilities creates the need for integration to achieve clarity of direction and unity of purpose in responding decisively and swiftly (Lawrence & Lorsch, 1967; Hitt et al., 1998; Tushman & Nadler, 1998; Venkatraman, 2000). The concentration on core competencies in the early 1990s, and the recent focus on (inter- and intra-) organizational collaboration are exemplary of the need to both differentiate and integrate in complex dynamic environments. In essence, organizations need to mirror the discontinuity and interconnectedness of their environments in order to remain viable. The degree to which organizations can achieve these competing demands is a measure of an organization's strategic flexibility[4], i.e., developing differentiated capabilities to pro-act in an integrated manner to unanticipated changes (Hitt et al., 1998).

Strategic flexibility in a turbulent and competitive business environment requires organizations to be dynamically stable (Boynton, 1993; Marchand, 2000). Organizations need to simultaneously develop a variety of differentiated capabilities in order to serve a range of changing customer and market demands, and integrate these for developing joint expertise and providing direction (Hitt et al., 1998; Nadler & Tushman, 1998). The underlying organizational design is an interconnected network of differentiated organizational capabilities for developing and sharing expertise (Ilinitch et al., 1998; Galbraith & Lawler, 1993; Nadler & Tushman, 1998). Advancements in information technologies are enabling organizations to attain the requisite dynamic stability for integrating the differentiated organizational capabilities. Business developments surrounding supply chain integration, and the management of enterprise resources and customer relationships are exemplary of the embedded and integrative role of IT. Subsequently, IT has become an integral part of the organizational design, wherein the interdependency between IT and business is intensely reciprocal (Rockart & Short, 1989; Boynton, 1993; Sambamurthy, 2000).

[3] The research was conducted by the Conference Board and Accenture amongst 510 CEOs from large companies across industries in the US, Europe and Asia. CEOs were asked to select the top three marketplace and management challenges from a list of 15 issues.
[4] Strategic flexibility is a polymorphous concept with different definitions depending on the context (see e.g., Evans, 1991; Volberda, 1996).

1.2 Information Governance: Toward a New Organizing Logic ?

As IT operates at the core of electronic business environments, the efficiency *and* flexibility with which IT capabilities - applications, infrastructures, skills and expertise - are developed and embedded in the organizational design, become business critical (Bharadwaj, 2000; Rockart et al., 1996; Roepke et al., 2000; Ross et al., 1996; Sambamurthy & Zmud, 2000). Herein, information technology[5] is defined as (Boynton & Zmud, 1987; O'Brien, 1993):

> *The organized combination of hardware, software, data resources and communication networks, as well as the knowledge, skills and methods, used for enabling electronically-based information collection, transformation and dissemination.*

The business imperatives of strategic flexibility and dynamic stability are posing new requirements on IT organizations to (Figure 1.2):

(a) Develop and deliver applications that facilitate business responsiveness to customer demands in a rapid and efficient manner, and;
(b) Provide cost-effective, scalable infrastructures and operations that enable cycle time improvement and streamlined, enterprise-wide business processes.

Similar to the business, IT organizations are facing competing demands to operate both efficiently and adaptively, requiring both standardization and innovation.

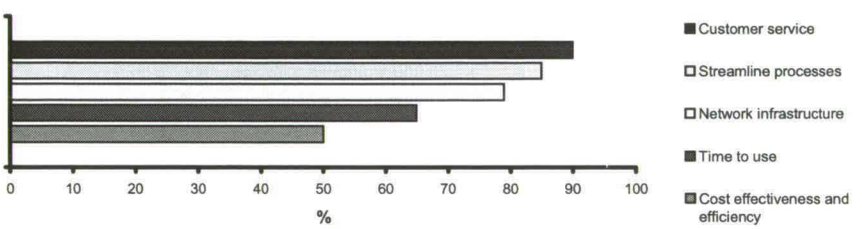

Figure 1.2. Key business priorities of the IT organization[6] (Information Week, 1999).

While traditionally decision-making for IT focused on either efficiency or flexibility, often in a sequential manner, currently it faces the dual demands for (a) flexibility and speed, and (b) efficiency and reliability (Allen & Boynton, 1991; Roepke et al., 2000; Weill & Broadbent, 1998). The latter concern is of long standing, in which decision-making was concerned with efficiency and cost reduction, often directed at the operational level (Gorry & Scott Morton, 1971). Subsequently, decision-making focused on managing IT as a strategic resource, in which the primary aim was to align IT with the business strategy, in order to gain competitive advantage (Parker & Benson, 1988; Henderson & Venkatraman, 1993; Luftman, 1996). Having emerged from both practices with ambiguous results and experiences[7], managers are recognizing the need to meet demands for both (a) delivering customized, high quality IT products and services, and (b) compressing costs, risks and time, in order to meet business needs in an efficient, reliable and effective manner.

As we move closer to a world where electronic business prevails, the importance - and complexity - of decision-making for IT will only increase. Contemporary strategic decision-making for IT needs to simultaneously (a) develop a variety of differentiated capabilities in order to meet a wide range of business demands, and (b) integrate these for sharing information, providing purpose and direction in realizing business value from IT (Weill & Broadbent, 1998). In contemporary IT-intensive competitive

[5] This definition includes (tele-)communication capabilities, i.e., ICT. The term 'ICT' is predominantly used in European and Canadian contexts, and is meant to accentuate both information and communication technological capabilities.
[6] Based on the responses of 250 senior IT executives in Information Week 500 companies; businesses identified as the 500 most innovative users of IT in the US.
[7] See e.g., Bharadwaj, 2000; Boynton & Zmud, 1989; Brynjolfsson & Hitt, 1996; Clark et al., 1997; Cross et al., 1997; Feeny & Willcocks, 1998; Henderson & Venktraman, 1993; Keen, 1991; Mata et al., 1995; Peppard & Ward, 1999; Rockart et al., 1996; Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998; Willcocks & Sykes, 2000.

business environments, there is thus a need to both differentiate and integrate strategic decision-making for IT in order to meet competing goals and performance demands (Peterson et al., 1998). The differentiation and integration of strategic decision-making for IT is referred to as *Information Governance*[8].

To date, however, there have been very few - empirical - studies conducted on how organizations go about achieving the requisite levels of differentiation and integration in strategic decision-making for IT. Griffiths (1994) and Benson (1996) indicate that this relatively new phenomenon will remain a pressing issue and a challenge for managers in realizing business value from IT. Weill & Broadbent (1998) likewise point out that many organizations struggle with a multitude of business and technical decisions, working on an optimal balance of capabilities at different organizational levels. Sambamurthy & Zmud (2000) conclude that there are increasing signs that the accumulated wisdom from the past decades is inadequate in shaping appropriate insights for contemporary and future *Information Governance* designs. Moreover, they state that there is a considerable gap growing between scholarly research and contemporary practice, and call for a new frame for examining the organizing logic for the governance of IT (Sambamurthy & Zmud, 2000). Interestingly, organization studies have recently also called for the need to learn more about what combinations of decision-making structures and integration mechanisms are most effective (Galbraith et al., 1993; Hill et al., 1992; Hitt et al., 1998; Lawler, 1996; Mohrman, 1993; Nadler & Tushman, 1998).

The confluence of (a) increasingly competitive and IT-intensive business environments, (b) competing demands for strategic flexibility and dynamic stability; and the growing evidence that (c) organizations are experiencing difficulty in leveraging IT to develop sustainable electronic business environments, and (d) the significant lack of relevant theory-laden models and empirical research, have rekindled significant debate and interest in a 'new organizing logic' for *Information Governance*. Business schools have recognized the management challenges, and are providing executive programs and seminars on a range of subjects such as: '21st century IT governance', 'the strategic role of IT leadership', and 'building core competencies in the IT function'.

More in the academic sphere, leading scholars in the field are discussing 'visions of the IT enterprise in the 21st century' (ICIS, 2000). They conclude that as we enter the 21st century, interest abounds in portraying visions of the IT enterprise, and in identifying key management challenges and research opportunities. They also indicate the significant need to collaborate with firms in collectively developing insights and enhancing knowledge about the IT enterprise for the 21st century. Key questions addressed by both academics and executives are (ICIS, 2000):

> *What are likely to be the most salient forces affecting the IT enterprise of the 21st century?*
>
> *How will the IT enterprise deliver value in the 21st century?*
>
> *What are likely to be the most significant challenges in transforming contemporary IT enterprises?*
>
> *What logic will be applied in governing the new IT enterprise?*

Scholars have also raised similar questions:

> *How should firms govern their IT activities in order to manage the imperatives of business and technology environments in the digital economy?* (Sambamurthy & Zmud, 2000)
>
> *Can we identify new practices for IT organizations for building and managing an evolving IT infrastructure for the electronic economy?* (El Sawy et al., 2000)

Ultimately, the answers to these and other questions will be provided through empirical research. However, the point in case is that there are many unanswered questions related to the design logic of *Information Governance*. In summary, the problem, from a theoretical, empirical and managerial perspective, can be stated as a lack of comprehensive understanding with regard to the - new -

[8] In Chapter 2, a definition for Information Governance is provided.

organizing logic for *Information Governance* in contemporary IT-intensive business environments. In Chapter 2, the specifics of this problem are discussed.

1.3 Research Aim, Questions & Boundaries

Following the foregoing problem situation, the general aim of this investigation is:

> *To gain understanding, through exploration and explanation, of the design logic regarding Information Governance in contemporary IT-intensive business environments, in order to (a) advance theory development, and (b) provide organizations with design strategies for improving Information Governance.*

The advancement of theory involves two different, yet inter-related activities. First of all, models and conceptual frameworks are developed and used to explore and explain phenomena, often described as problem situations. Conceptual frameworks explain, either graphically or in narrative, the focus of study, i.e., the key constructs, variables, factors, and the presumed relationships among them (Miles & Huberman, 1994). Following the conceptual framework, observations and analyses are conducted to validate and improve the conceptual framework (Figure 1.3). Observations of theory-laden or practice-based problems can also induce the development of conceptual frameworks, which are subsequently examined. As we progress through iterative cycles, our *Weltanschauung* is extended in evolutionary and revolutionary manners. The latter is often referred to as a paradigm[9] shift (Kuhn, 1970), as a result of inconsistencies or dissatisfaction with existing conceptual frameworks or schools of thought. Consequently, new alternative conceptual frameworks are proposed, developed, accepted or rejected.

The foregoing discussion on the new organizing logic for *Information Governance* (Section 1.2) is exemplary of the cyclical processes of scientific knowledge generation over the past decades, and the current dissatisfaction with extant conceptual frameworks. However, the field of Information Systems - including *Information Governance* - is also an applied discipline, and a secondary objective of this study is to provide organizations with design alternatives for improving their *Information Governance* design.

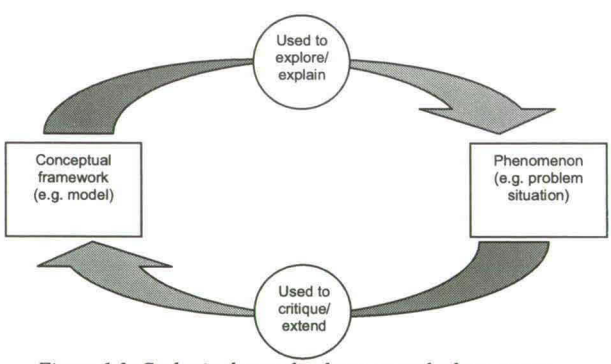

Figure 1.3. Cycles in theory development and advancement (Based on De Leeuw, 1990; Mitroff et al., 1974).

Based on the research problem and research objectives, the general research questions are stated as:

- *How (well) do organizations in contemporary IT-intensive business environments govern their portfolio of information technologies?*
- *What is the (new) organizing logic of Information Governance?*

[9] In terms of Kuhn (1970), a paradigm represents a particular, coherent tradition of scientific research.

Conceptual frameworks are, however, bounded by rationality, values, time and space (Simon, 1961; Bacharach, 1989). Thoroughness and accuracy - rigor - in empirical research requires the explication of these boundaries. A conceptual framework is bounded by rationality, implying that frameworks are limited in the sense that they do not include all possible alternatives, or capture the entire problem due to its complexity. Conceptual frameworks are an abstract and simplified model of reality in order to explore and explain (certain elements of) that reality. In this study, *Information Governance* is the main focus of attention. Conceptual frameworks are also used in a satisficing manner to address research objectives and questions. Consequently, as the (re)search progresses, satisfaction increases until an answer is found (Simon, 1961). However, new insights may lead to new questions, which lead to new frameworks and (re-) search processes. The cumulative of these (re-) search processes leads to a body of knowledge and expertise in a certain area. This study is 'bounded' in the sense that it addresses the foregoing questions concerning Information Governance. The results may lead to new questions, which would require further (future) investigation.

Regarding values, Bacharach (1989) indicates that different analytic lenses uncover different facets of a phenomenon, and the assumptions behind the inquiry shape the questions and answers that emerge. Assumptions are often based on premises concerning a phenomenon, and the disciplines used to uncover the intricacies of the phenomenon, in order to provide solutions to a problem situation. The process of understanding and knowledge creation occurs within a context of strengths and limitations of a particular way of seeing, which is rooted in a particular metaphor or image (Morgan, 1986). Any frame or reference, or paradigm for studying a phenomenon is consequently bound to be partial.

Reference disciplines in the field of Information Systems[10] include, Philosophy, Political science, Computer science, Economics and Organization science (Keen, 1980). The primary reference discipline used in this study is Organization science. In particular, a contingency-based, information-processing, decision-making paradigm of organization and governance (Cohen & Levinthal, 1990; Daft & Lengel, 1986; Galbraith, 1973, 1994; Lawrence & Lorsch, 1967; Nadler & Tushman, 1978, 1998; Nielen, 1993; Simon & March, 1958) is applied to address the research objectives and research questions concerning *Information Governance*.

The focus on *Information Governance* leads to a second demarcation. This study is primarily concerned with *strategic decision-making* across the range of exploitation and innovation activities for infrastructural and business applications of IT (Figure 1.4).

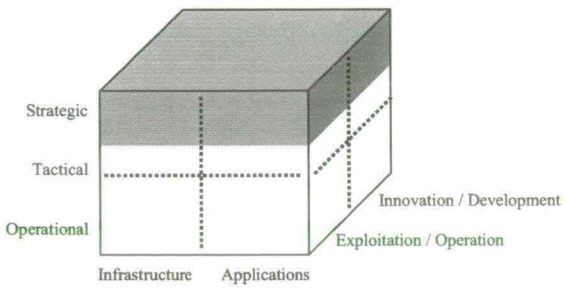

Figure 1.4. Focus of this study.

Strategic decisions are those decisions that commit significant resources and set important precedents for sub-decisions, and the future competitive position of the organization (Mintzberg, 1978; Eisenhardt & Zbaracki, 1992). Strategic decisions are non-routine and interdependent decisions made by managers in 'upper echelons', and are characterized by relatively high uncertainty, complexity and ambiguity (Dean et al., 1991; Gorry & Scott Morton, 1971; March, 1988). As such, they are different from operational decision-making.

With respect to IT, strategic decisions are *business* decisions whose intended IT-related impact is perceived as significant to the organization (Parker & Benson, 1988; Henderson & Lentz, 1994; Ward

[10] Over the past decade, the necessity of a distinct theoretical base vs. the use of reference disciplines has been debated (Ein-Dor & Segev, 1989; Galliers, 1992; Keen, 1980; Moody, 2000; Weber, 1997).

& Griffiths, 1996; Weill & Broadbent, 1998). This study does not address operational decision-making concerning a specific element or aspect within the portfolio of IT functions. Consequently, this study employs a business information-demand perspective regarding strategic IT decision making, and does *not focus* on the locus and execution of *IT-supply services*, hence also the term *Information Governance*[11] (see also Chapter 2).

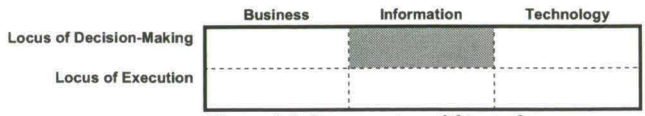

Figure 1.5. Demarcation of this study.

Spatial boundaries are conditions restricting the use of theory, and the generalization of the conclusions to specific units of analysis, i.e., specific types of organizations (Bacharach, 1989). This study is conducted in large multi-business-unit organizations, operating in a complex, dynamic and IT-intensive Financial Services marketplace. The companies were purposefully - not randomly - selected. This study is thus conducted within these spatial boundaries. Furthermore, the time frame of this study extends between January 1998 and March 2000.

In summary, the research objectives and the research questions, and space and time bound this study. Consequently, the results and conclusions drawn from this study are interpreted, and should be considered within these boundaries.

1.4 Outline

In the introduction, (*Chapter 1*) a general overview was presented of contemporary business environments and the imperatives for business and IT. Information Governance was introduced as a new logic for the governance of IT, and the importance of the requisite levels of differentiation and integration of strategic IT decision-making was discussed. The problem was introduced, and the research aim, research questions and research boundaries were described.

In *Chapter 2*, the domain and details of the problem concerning Information Governance are described. Based on a review of previous studies, precise delineation of Information Governance, and the problématique surrounding Information Governance is presented. Subsequently, *Chapter 3* describes the design of this study, including the different stages of the empirical and design cycles of research, and the appropriateness of multiple case study research for the purposes of this investigation.

In *Chapter 4*, the conceptual framework, consisting of the main constructs and interrelating propositions, is presented. The conceptual framework is based on previous studies and a literature study of organization design theory. The research methods, including the operationalization and measurement of the constructs, and the data collection and analysis, are described in *Chapter 5*. The case studies in Financial Services are described and analyzed in *Chapter 6*. Finally, in *Chapter 7*, the conclusions, limitations, and implications of this study are discussed, and directions for future research are presented.

[11] Information Governance is a subset of Information Technology Governance, focused on business information-demand, rather than technology information-supply.

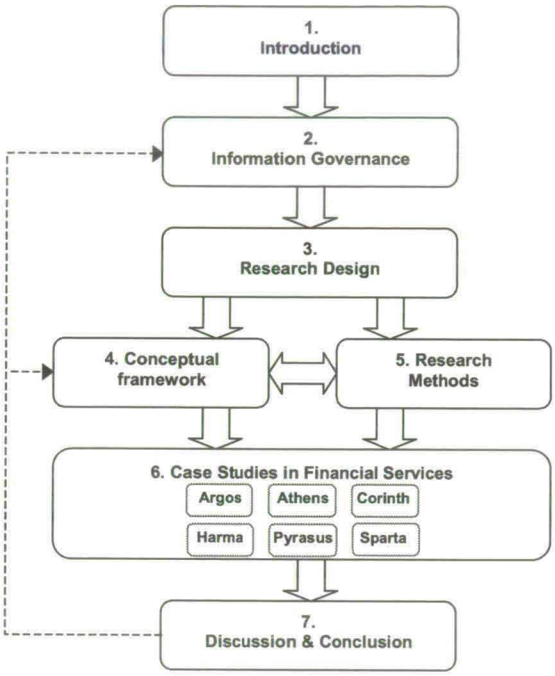

Figure 1.6. Outline.

Chapter 2: Information Governance Problématique

Conformity is the jailer of freedom and the enemy of growth – John F. Kennedy

2.1 Introduction

In the introduction (Chapter 1), an outline of contemporary developments and imperatives, and the general problems of Information Governance were described. In this chapter (Chapter 2), previous studies are summarized in order to specify the research problem and questions more accurately. A historical perspective is utilized in understanding and motivating the research problem and objectives. While some may argue that historical analyses are irrelevant, and we should be more concerned with the future, history is full of accounts from which we can learn - not by extrapolation, but by analogy - in order to facilitate the creation of that desired future (Schumpeter, 1942; Toynbee, 1953). In examining the current hypercompetitive environment, for instance, Auperle (1996) draws an interesting parallel with Xenophon's *Anabasis*: the successful retreat in 401 BC of a large, culturally differentiated Greek army, trapped in a treacherous and hostile Persian environment.

Yates & Benjamin (1991) and Applegate et al. (1999) point out that by understanding changes accompanying IT in the past, we will be better able to understand future possibilities, as well as what is necessary to realize them. More specifically related to this study, Simon (1954) concludes:

> *"History is full of accounts of the successes and failures of empires, hierarchies, and networks expanding and transforming. Despite sharp distinctions in time and context, a common problem in all such organizations has been the dichotomy between the pressure for centralization to assure direction, and the countering pressure for decentralization to secure responsiveness. While the events of history may not repeat themselves, the reactions that evoke this dilemma seem to persist through time".*

Significant advances in our knowledge, and our ability to develop theory, can be made through reviews of previous studies. Keen (1980) and Galliers (1992) argue that rigor in IS research requires that studies be focused on past developments, in addition to current relevant developments. An analysis of past research not only leads to new insights, but also ensures that subsequent research builds on past endeavors, in order to develop a cumulative body of knowledge in the IS field (Keen, 1980). Likewise, Benbasat & Zmud (1999) indicate that studies considered rigorous are those that are aware of prior theoretical and empirical studies on the topic being examined:

> *"Without such cumulative research tradition, it becomes difficult, if not impossible to develop and assess strong theoretical models, such that actions can confidentially be suggested for practice".*

In this spirit, this chapter analyzes previous conceptual and empirical studies in the field of Information Governance. The origins of governance are briefly presented in Section 2.2, followed by a discussion of the governance paradigm in Section 2.3. Developments in Information Governance are described in Section 2.4. Subsequently, previous studies on Information Governance are presented (Section 2.5), and discussed (Section 2.6) in order to specify the research problem and questions.

2.2 Origins of Governance

The contemporary English word *Governance* is derived from the Latin word *Gubernare*, which is derived from the Greek words: *Kubernan* - to steer -, and *Kubernetes* - he who steers, and provides overall direction (Webster's International Dictionary, 1966). *Kubernan* and *Kubernetes* denote the process of *Kubernesis*, i.e., the task of keeping a ship on its course in the midst of unexpected changing circumstances. Norbert Wiener (1956), conceived the word *cybernetics* - the science describing goal-directed systems, and the guidance of a system under changing conditions - from the Greek *Kubernesis*.

The metaphor is that of 'The Odyssey', in which Odysseus travels for a decade across perilous seas in search of his kingdom Ithaca (Fagles, 1996). As the 3000-year-old[12] myth goes, although loosing 6 oarsmen, Odysseus successfully sailed through the Strait of Messina, attempting to avoid Scylla living in the rocky cliffs, and the whirlpool Charybdis. Odysseus avoided both by steadily controlling the helm, and having his men row in a swift and rhythmic fashion. For, without controlling the helm, they would run against the rocky cliffs, and without rowing in a coordinated fashion they would have drifted into the whirlpool (Fagles, 1996).

Though a myth, the story of Odysseus portrays an important innovation in governance and evolution in naval strategies. Archeologist and historians indicate that up until the 1200 BC, Greek ships were built for trading purposes, and were large and wide in order to allow for substantial cargo (Hamlyn, 1963). These ships often had a single helmsman at the stern of the ship, and relied on a large sail for power (Figure 2.1).

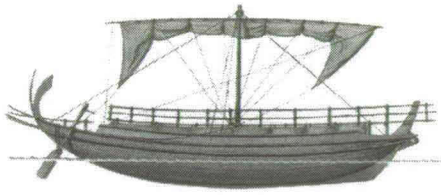

Figure 2.1. Greek merchant ship, 3400 BC (Hamlyn, 1963)

Historians also point out that approximately 1200 BC, probably during the Trojan War, the Greeks adapted their naval strategies and sea tactics (Hamlyn, 1963). They redesigned their ships to improve speed and flexibility, as these were essential in naval warfare to run down slower ships, or out-maneuver enemy ships. The war galleys were streamlined, built narrower and were equipped with a bronze ram under the bow. In order to provide the vessel with speed and flexibility, a set of oarsmen was placed on each side of the ship, thereby creating a *bireme*, i.e., two levels of oarsmen on both sides of the ship (Figure 2.2). The helmsman's role was to provide for direction and precision of attack, while the dual set of oarsmen allowed for speed and flexibility. By rowing in opposite direction, the vessel could rotate on single spot, and confront the enemy without being surprised or at a disadvantage. The sail was essential as it provided a stable platform for powering the ship, allowing the oarsmen to rest and regain strength for sea battle.

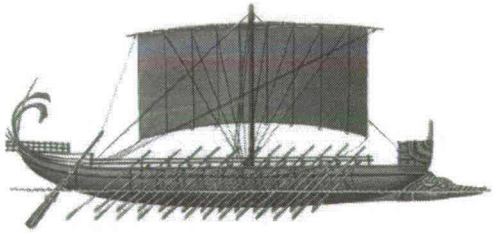

Figure 2.2. Bireme: Greek war galley, 1200 BC (Hamlyn, 1963)

[12] Historians suggest that the Odyssey was written approximately 200 years after the Trojan War of 1200 BC (Fagles, 1996).

However, steering a *bireme* was a complicated task. With the helmsman providing direction, and the dual set of oarsman enabling speed and flexibility, coordination was essential, especially in hostile waters. First of all, because the helmsman was not rowing, and the oarsman could not see in what direction they needed to row, communication between the helmsman and oarsmen was critical in making sure the *bireme* was moving in the right direction at the right speed. The helmsman was also responsible for knowing when to use the sail, as only he had oversight. The dual set of oarsmen also provided for coordination challenges.

In order to power the vessel, the oarsmen needed to row in rhythm across two levels of oars on both sides. Different devices were used to achieve this. First of al, the oarsmen were carefully selected based on their physical strength and experience. More importantly, only Greek civilians were selected to row on board of war galleys. Greek commanders were afraid that slaves would not stay loyal 'in the heat of the battle'. Secondly, the oarsmen were seated in a slope, and not in a straight vertical line. This allowed for a higher degree of freedom when rowing. Thirdly, a row master was added to each level in order to make sure that the oarsmen were rowing in sync. The first level row master would communicate with the helmsman, and pass the information on to the second level row master. Each of the row masters would make sure that his level of oarsmen was rowing in sync. Finally, chanting, drums and rhythmic music were used as means for motivating the crew and rowing in alignment. Thus, both formal and informal means of coordination were utilized on board of the *bireme* for providing direction and flexibility.

Faced with a hostile and unpredictable naval warfare environment, the Greeks redesigned their vessels for improving speed and flexibility, but also maintained efficiency and stability. Instead of allocating power in a single location, i.e., the helmsman and the sail, they installed and distributed power to the different operating oarsmen, but never did the helmsman relinquish all of his control, and the sail was never abolished. Instead, row masters and drums were used to achieve the required coordination in order to achieve both efficiency and flexibility.

Recalling Chapter 1, and by analogy, in a turbulent and competitive environment, organizations face competing demands for efficiency and flexibility, and require a dynamically stable organizational design. In order to achieve these competing demands, organization will need to differentiate in order to respond to the changing needs of the organization. However, in order to provide clarity of direction and unity of purpose, the organization will need to integrate the differentiated units. The Greek naval history suggests that differentiation without integration will cause organizations to drift without any sense of direction. While contemporary organizations may not use 'row masters' and 'drums' to achieve coordination, these metaphors do suggest that organizations can use different types of (direct and indirect) coordination mechanisms.

2.3 The Governance Paradigm

The governance paradigm is based on a general systems approach of organizations (Ashby, 1956; Von Bertalanffy, 1956), which is rooted in the science of cybernetics (Wiener, 1956). To view organizations as cybernetic systems is to emphasize the importance of operations, governance and strategy (Scott, 1998), or what Parsons (1967) describes as:

- The technical system: production functions that transform inputs into outputs, directed by the governance system;
- The governance system: directing and controlling the production system and mediating between the organization and the task environment, established by the strategic institutional system;
- The institutional system: establishing the wider organizational boundaries, its purpose and legitimacy, and determining its goals.

Scott (1998) refers to these three systems as (a) the strategy center, (b) the governance center and (c) the operational center[13] (Figure 2.3).

The strategy center sets the goals for the organization, which occurs in response to the demands or preferences from the environment, including, e.g., customer demands, supplier orders, and government

[13] This study is primarily focused on the 'governance center' as applied to IT, and the relationships with the 'strategy center' and the (performance) of the 'operational center'. As indicated in Chapter 1, this study does not focus on the coordination and use of IT in operational processes. See Toppen (1999) for an extensive study regarding the design and use of IT in the operational (network) processes in financial services.

regulations. The selection of goals is based on information received from the environment and the operational center, so that favorable exchanges can occur between the organization and the environment. The setting of goals and general performance standards thus occurs in interaction between the organization and the task environment (Thompson & McEwen, 1958; Thompson, 1967). From this perspective, strategy is viewed as the mediating force between the organization and the environment (Galbraith, 1987; Mintzberg, 1979), and describes the policies and programs for dealing with the environment in reaching the organization's goals (Daft, 1998; Quinn, 1980). These goals supply the value premises - assumptions and beliefs about what ends are preferred (Donaldson & Lorsch, 1983; Simon, 1961) - that underlie the management of decision processes and decision-making (Thompson, 1967). The strategy center thus provides the strategic context for governance, which in its turn, directs and monitors the operational center.

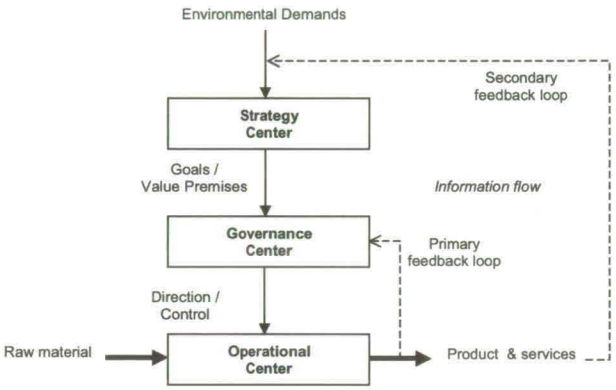

Figure 2.3. Cybernetic model as applied to organizations (Adapted from Scott, 1998).

The governance center consists of interrelated and interdependent decision-making units that share information, originating from the strategy center and the operational center. The operational center is concerned with the transformation of raw materials into products and services, and consists of several interdependent operational (sub-) units (Scott, 1998). These operational (sub-) units collectively constitute the primary processes of the organization.

Based on Ashby (1956), Scott (1998) distinguishes between two monitoring loops in the system. The primary loop handles disturbances in 'degree' - applying existing decision rules -, whereas the secondary loop handles disturbances in 'kind', determining whether it is necessary to redefine the value premises upon which decision-making is based. The directive/control and monitoring loops[14] comprise of information flows between the governance center, the operational center, and the task environment.

Organizations, however, are not mechanical thermostats. Scott (1998) indicates that the cybernetic model of organizations gives the impression of a 'taut machine'. Errors are only selectively detected due to bounded rationality, and corrected in satisficing manners (March & Simon, 1958; Simon, 1961). Moreover, as products and services become increasingly information-based and intangible, their acceptance by the environment becomes more difficult to assess. Consequently, information flows are less efficient and more timely, thereby increasing the level of uncertainty (Lawrence & Lorsch, 1967; Thompson & McEwen, 1958). Furthermore, environmental demands are not uniform and/or placid. Organizations face competing and changing demands from different constituencies in the task environment (Donaldson & Lorsch, 1983), and seek to satisfy multiple, often conflicting, goals in different manners (Cyert & March, 1963). Information is therefore not shared across decision-making units as frequently and unambiguously as suggested by the cybernetic model (Daft & Lengel, 1984). Yet, by the same token, the cybernetic model does underscore the importance of information and

[14] Argyris & Schon (1978) apply these two monitoring loops to organizations, and provide a description of organizational learning: *"Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it receive information and take corrective action. Double loop learning occurs when error is detected and corrected in ways that involve modification of an organization's underlying norms, policies and objectives".*

communication for governing the operational center, and is the foundation for many classical and contemporary organization design paradigms and models[15].

From a general systems perspective, an organization is viewed as a complex open social system, interacting with its environment, and consisting of a set of interdependent subsystems that produce a purposeful whole (Daft, 1998). Interacting subsystems in a social system imply that stakeholders - individuals, groups, organizations, and communities - are interdependent, and need to work together in a coordinated fashion to achieve objectives. Complex open social systems share several common characteristics that apply to organizations (see also Appendix C; Ashby, 1956; Daft, 1998; Galbraith & Lawler, 1993; Gresov & Drazin, 1997; Katz & Kahn, 1966; Lawrence & Lorsch, 1967; Thompson, 1967).

Building forth on the general systems theory, De Leeuw (1990) presents the *governance paradigm*, which resembles the cybernetic model of organizations (Figure 2.4). Governance is a purposeful intervention in order to achieve a desired output, and describes a subsystem of decision-making units for directing and coordinating operational subsystems in the governed system. The basic logic underlying the governance system is the division and coordination of decision-making units, in order to direct the operational system towards the realization of the goals of the organizational system (Simon, 1961).

In general, governance is the system through which corporations are directed and controlled. The governance system specifies the distribution of rights and responsibilities among different stakeholders, and specifies the rules and procedures for making decisions on corporate affairs (OECD, 1999). Governance describes the differentiation and integration of decision-making units, in order to direct the operational system towards the realization of the organization's goals, consistent with the logic and perspective of the organization's strategy (Henderson & Lentz, 1994).

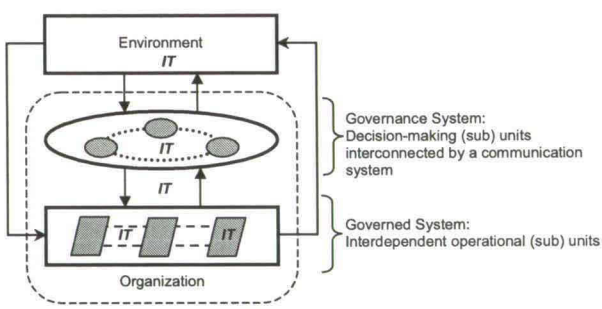

Figure 2.4. Graphical representation of the governance paradigm (Adapted from De Leeuw, 1990).

Decision-making units can be identified at different levels, i.e., an individual, a group, and/or an organization, each having discretion to make certain decisions within boundaries (Nielen, 1993). In order to purposefully direct the operational subsystems, the multiple interdependent decision-making units require communication of information and decision-making in order to achieve coordinated effort (March & Simon, 1958; Lawrence & Lorsch, 1967). Governance thus requires a set of interconnections that serve to coordinate the decision-making units. Lawrence (1958) describes the decision-communication system as a communication system that links the decision-making units into a purposive whole, in order to adjust and respond to external and internal demands. Systems associated with the communication of information and decision-making are applied within and between the governance system and the governed system, in order to exchange information and support communication and coordination[16] (Nielen, 1993).

[15] See e.g.: Daft, 1998; Galbraith, 1977; 1994; Galbraith & Lawler, 1993; Katz & Kahn, 1966; Lawrence & Lorsch, 1967; Tushman & Nadler, 1982; Nadler et al., 1992; Leavitt, 1965; March & Simon, 1958; Sanchez, 1997; Scott Morton, 1991; Senge, 1996.

[16] In contemporary environments, these systems generally refer, but are not limited to the application of information and communication technologies (Bemelmans, 1994; Nielen, 1993). In information-intensive organizations, such as banking and insurance operations, IT is both production and coordination technology (Applegate et al., 1999). Software is often embedded in products and services, while the coordination between business processes and functions is enabled by IT - transactional and infrastructural - systems (Toppen, 1999; Weill & Broadbent, 1998). This study is primarily concerned with the governance of IT,

De Leeuw (1990) describes the complexity of the governance system according to several interrelated factors[17].

Decomposable systems are characterized by low interdependency between decision-making units. When decision-making units independently share the same information resources - pooled interdependence (Thompson, 1967) -, or when the output of one decision-making unit serves as the input to another decision-making unit - sequential interdependence (Thompson, 1967) -, the governance system is described as a relatively decomposable and simple system. Complex systems, on the other hand, are characterized by reciprocal interdependence (Thompson, 1967), in which decisions made by the sub-units are mutually dependent and influential, thereby increasing the need to exchange information. In complex governance systems, each decision-making unit presents direct decision contingencies for every other unit (Lorsch & Lawrence, 1970).

Predictability refers to the ability to produce qualitatively right predictions for the future, and is related to uncertainty. Information is required to generate predictions for the future. The lack of information creates uncertainty, and predictability decreases (Daft, 1998). High predictability is associated with low complexity, i.e., simple systems, and requires less information processing on the part of the governance system

Controllability describes the identification and implementation of control measures to direct and influence the operational system. Situations where control mechanisms are identified and implemented with ease in a timely manner are described as simple. Low decomposability (reciprocal interdependence) and low predictability hamper the simple identification and timely implementation of control measures.

Homogeneity describes the similarity or the variety in the activities of the governance system. If a governance system consists of homogeneous decision-making units, the system is considered simple. With regard Information Governance, the decision-making system consists of different, heterogeneous decision-making units, e.g., corporate management, IT management, and business management. Information Governance can thus be regarded as a heterogeneous system.

More *information processing* within a certain response time leads to higher complexity. High decomposability and high predictability upset this relationship. Heterogeneity and interdependencies in an uncertain environment necessitate greater amounts of information processing (March & Simon, 1958). Given low decomposability, low predictability, and problematic controllability, the information processing requirements of the governance are high. As the required information processing capabilities become more complex, vertical information mechanisms become inadequate to meet the increasing information processing demands, and additional supplementing horizontal information mechanisms are required (Lawrence & Lorsch, 1969).

De Leeuw (1990) states that the degree to which the governance system realizes the desired output is a measure of *governability*, i.e., the capability to govern effectively. Governability requires the specification of the goals and a model of the operational system. According to the governance paradigm, although goals are required for providing purpose to the system, these goals may be incomplete, implicitly conflicting, and may change over time as the organization develops (Cyert & March, 1963; De Leeuw, 1990; March & Simon, 1958).

The arrows in Figure 2.4 graphically represent the exchange and flow of information between the environment and the governance system, the governance system and the operational system, and the operational system and the environment. Systems of information and communication are used to receive external and internal information, and to signal appropriate control measures. The information processing capability of the decision-communication system thereby influences the variety of interventions that can be effectively executed, subsequently affecting the capability to govern

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and not with the use and impact of IT for enabling and supporting the governance system. Nielen (1993) and Bemelmans (1994), amongst others, have elaborated and built forth on the 'governance paradigm', focusing on the role of IT in shaping the governance system. This study does not directly address this subject, nor pursues this angle.

[17] These factors are also discussed in the organization design literature, albeit from a task-oriented perspective, i.e., task interdependence, task uncertainty, and task variety (Daft & Lengel, 1984; Galbraith, 1973; Thompson, 1967; Tushman & Nadler, 1978). In the case of governance, the main task is managing decision processes and decision-making (March & Simon, 1958; Simon, 1961; Thompson, 1967).

effectively. The degree of governability is thus influenced by the information processing capabilities (De Leeuw, 1990; Nielen, 1993).

Within IT-intensive business environments, IT is an integral part of the operational system, in which the interdependency between IT and business is complex and intensely reciprocal, and characterized by *information* services. The interdependencies in the governance system also depict the exchange of *information*, and the sharing of domain-specific expertise and knowledge for decision-making (Grant, 1996; Lawrence & Lorsch, 1967; Mintzberg, 1979; Thompson, 1967). The interface between (a) IT decision-making units and the technical subsystem, and (b) business decision-making units and the business subsystem is thus characterized by information exchange and joint decision-making (Nielen, 1993).

Following the governance paradigm, the interdependent IT and business decision-making units, and their efforts to influence and direct the functioning and effectiveness of the organization's operational - business and IT - systems, depict an *Information Governance framework* (Figure 2.5). The Information Governance framework describes the differentiated business and IT decision-making units, each interacting with a sub - technical and business - environment, and directing and controlling different - technical and business - subsystems within the organization's operational system. The sub-task environments provide the resources (i.e., informational, physical, financial, and human) for the divided operational systems and differentiated decision-making subsystems.

The technical subsystem describes the IT operations and services provided to the business, and depicts the portfolio of IT activities. The business subsystem describes the primary business processes involved in the acquisition, development, production, and delivery of business products and services to the external environment. The Information Governance framework postulates that both IT and business decision-making units individually and collectively direct and control the organization's operational - business and IT- systems (Parker & Benson, 1988; Ross et al., 1996; Weill & Broadbent, 1998; Willcocks et al., 1997). Governability of IT is thus a shared quality of business and IT decision-making units.

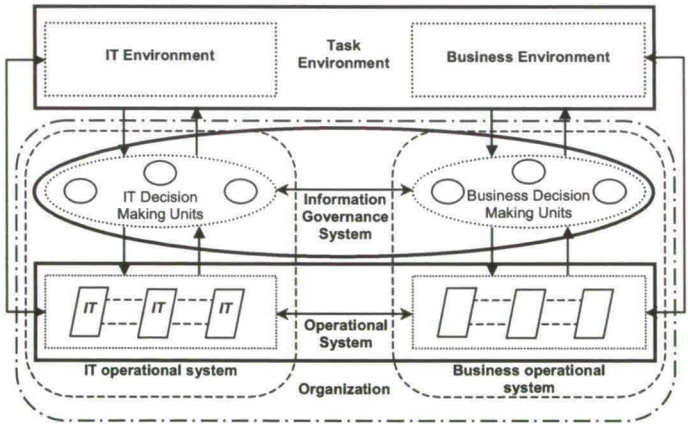

Figure 2.5. An Information Governance framework.

In the following sections, the concept of Information Governance is discussed and defined (Section 2.4), and developments and previous studies in Information Governance are outlined (Section 2.5)

2.4 Information Governance

The concept of Information Governance has been the subject of much debate and speculation over the past decades (King, 1983; George and King, 1991; Sambamurthy & Zmud, 2000). Although questions and concerns regarding Information Governance have been around since the commercial introduction of computers in companies (De Wit, 1994), Brown (1997) argues that there is no consistent body of knowledge regarding this subject. Recently, Brown and Magill (1998) conclude that despite 30 years of

empirical research and management theories, we still have too many gaps in our knowledge, and there is an absence of theoretical or empirically-based guidelines addressing Information Governance. Griffiths (1997) indicates that business and IT managers are realizing that responsibility for IT can not continue as a grey area of management. Nevertheless, Griffiths (1997) concludes that there is no consensus on how information technology decision-making should be coordinated and directed. Hodgkinson (1996), Sambamurthy et al., (1994), and Willcocks et al., (1997) concur, and argue that this is attributed to the simultaneous enduring and evolving nature of the Information Governance problématique.

A great deal of the confusion stems forth from: (a) the different theoretical perspectives (see Section 2.4.1), (b) the different terminologies (see Section 2.4.2), (c) the development of different approaches over time, influenced by the evolution in organization and technology (see Section 2.4.3), and (d) contemporary rhetoric (2.4.4). These issues are discussed in the subsequent sections.

2.4.1 Theoretical Perspectives

Theories of governance are rooted in different theoretical perspectives, known as Transaction Cost Theory, Agency Theory, and Organization Design Theory (Daft, 1998).

In the form of *transaction cost economics* (Arrow, 1969; Coase, 1937; Williamson, 1996), governance is referred to as an institutional framework in which the integrity of transactions is decided. The dominant forms of inter-organizational governance are markets, hierarchies and networks. Increasing business competition and advancements in IT, have extended these alternative forms towards electronic markets, electronic hierarchies, and electronic business networks (Toppen, 1999). Over the past decade, different studies have been conducted on these emerging electronic governance mechanisms.

Within the *agency theory* (Jensen & Meckling, 1976), governance is concerned with the control and regulation which needs to be exercised in order to ensure that the interest of shareholders ('principles') are safe guarded by corporate management ('agents'), and their rights and wishes respected. Good governance is based on principles of accountability and transparency in the composition and stock ownership of boards of directors, and CEO compensations (Dalton et al., 1998). This topic has recently received much attention, both in the academic literature and the business press, in the form of the 'Corporate Governance' debate. Previous studies are, however, inconclusive and provide conflicting results (Dalton et al., 1998).

From an *organization design* perspective, governance refers to the study and design of working arrangements (March & Simon, 1958), and is a means of infusing order in relationships, where conflicts threaten to upset opportunities to realize mutual gains and improve performance (Williamson, 1996). Governance is represented by a decision-making paradigm, rooted in the seminal work of Barnard (1938), March & Simon (1958), and Cyert & March (1963), subsequently criticized and extended by Lawrence & Lorsch (1967), Galbraith (1973), Tushman & Nadler (1977), Weick (1979), and Daft & Lengel (1984), and summarized by Mintzberg (1979), March (1988), and Scott (1998). Using a living system as a metaphor, Simon (1961) describes the decision-making paradigm of governance as:

> *"The anatomy is to be found in the allocation of decision-making functions, while the physiology is to be found in the processes whereby the members' decisions are influenced and coordinated".*

Within the IS field, the decision-making paradigm is the dominant interpretation and conceptualization of governance (cf. Bemelmans, 1980; Boynton et al., 1992; Brevoord, 1991; Brown & Magill, 1998; Hodgkinson, 1996; King, 1983; McFarlan, 1973; Nielen, 1993; Ribbers, 1996; Rockart et al., 1996; Sambamurthy & Zmud, 1999; Venkatraman et al., 1993; Weill & Broadbent, 1998), and is basic to the governance paradigm (see Section 2.3).

2.4.2 Terminology

Despite, or maybe precisely due to the dominance of the decision-making paradigm of governance, a multiplicity of terms exist to describe Information Governance, including:

- *Information Management*	(Boynton, 1993; Earl, 1996)
- *Information Politics*	(Strassmann, 1995; Davenport, 1997);
- *Information Infrastructure*	(Applegate & Elam, 1992)
- *Information Architecture*	(Allen & Boynton, 1991)
- *IT Governance*	(Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998)
- *IT Management Architecture*	(Boynton et al., 1992)
- *IT Structure*	(Tavakolian, 1989)
- *IT Decision-making Culture*	(Sambamurthy et al., 1994)

While each of these terms involves decision-making for IT, they differ on two significant dimensions:
- A focus on the structure or the process of IT decision-making;
- Business (information) oriented decisions or, (information) technology oriented decisions.

For instance, both Sambamurthy & Zmud (1999), and Weill & Broadbent use the term 'IT governance', but they refer to different aspects. Sambamurthy & Zmud (1999) provide a *structural* definition, i.e., the allocation of decision-making for IT activities, whereas Weill & Broadbent (1998) present a *process* definition, i.e., articulating the business case for IT, setting the principles that guide IT investments decisions, and reviewing on-going and completed programs. Luftman (1996) provides a similar process-oriented view of IT governance, focused on the prioritization and selection of IT initiatives. Allen & Boynton (1992), on the other hand, focus on the structure and distribution of information *technology* resources, thereby depicting a structural and technology-oriented interpretation of decision-making for IT.

Applegate & Elam (1992) encountered a similar phenomenon in their study on the changing role of the IS leader:

> *"This seemingly minor difference in terminology reflected a major difference in approach. Those individuals who had risen to their position through the IS organization often use the term 'information infrastructure', stressing the technical standards and architecture that would be needed to support business process integration. In contrast, those individuals with strong business backgrounds often use the term 'information infrastructure' stressing the need for sharing information and shared management decision-making".*

Bemelmans (1996) also found a similar result in his study, in which information infrastructure was interpreted as a 'technical artifact'. The confusion is caused by the different interpretations regarding information. Information is commonly defined as something obtained by processing data to produce meaning, reduce uncertainty and gain knowledge (Earl, 2000). Applegate & Elam (1992) and Bemelmans (1996) indicate that business and IT executives often have different semantic models of 'information infrastructure'. Other typical differences in interpretations include system, process, interface, and function (Table 2.1).

Table 2.1. Differing technical and organizational interpretations (Adapted from Moosbruker & Loftin, 1998).

Concept	*Technical interpretation*	*Organizational interpretation*
System	A collection of computer and communications hardware, coupled with software, all designed to perform according to a defined set of requirements.	The organization in all its complexity, including the patterns, interconnections, and relationships with its environment.
Process	An ordered series of work steps that transform a set of inputs into a set of outputs.	The 'how' the organization goes about doing something, as distinct from the 'what' an organization does.
Interface	The boundary between systems or system components, or between a system and a user.	The boundary between organizational departments or units
Function	An operation or set of operations performed by a system, often related to a defined business requirement.	A set of tasks performed for and by a particular organizational unit or department.

Nielen (1993) concludes that, in contrast to the laws of the physical, the laws that govern information remain obscure. The dilemma of Information Governance, however, lies not at the physical level. Nielen (1993) proposes a model of decision-making consisting of three interrelated domains: the physical domain, the informational domain and the emotional domain. Information Governance is located within the informational domain, and deals with the semantics and pragmatics of information, i.e., with observation, understanding, communication, and influence (Figure 2.6). The emotional domain contains values and beliefs, and provides inspiration and valuation in decision-making. Whereas Information *Technology* deals with the hardware, software, data sources and communication channel capacities, Information Governance is concerned with business decision-making based on the sharing of information, observations, and valuation.

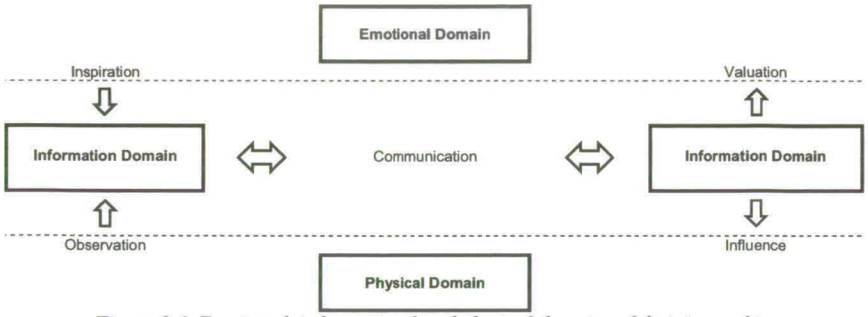

Figure 2.6. Emotional, informational and physical domains of decision-making (Adapted from Nielen, 1993).

Semantic models are developed in previous academic and professional education, and are often reinforced by the organizational work environment. Differences in semantic models are frequently associated with misunderstandings and conflicts between business and IT stakeholders (Parker et al., 1997; Peppard & Ward, 1999; Weill & Broadbent, 1998). These stakeholders represent groups or individuals that influence, and are affected by decisions regarding IT, and may thereby have different - often competing - stakes in IT (Rockart & Hofman, 1992; Ward, 1995).

Information Governance refers to the business decision-making platform for IT, concerned with the locus and process of decision-making for IT, and the involvement of business and IT executives. It is specifically focused on business and IT executive relationships, and the business decision-making agenda for IT (Figure 2.7).

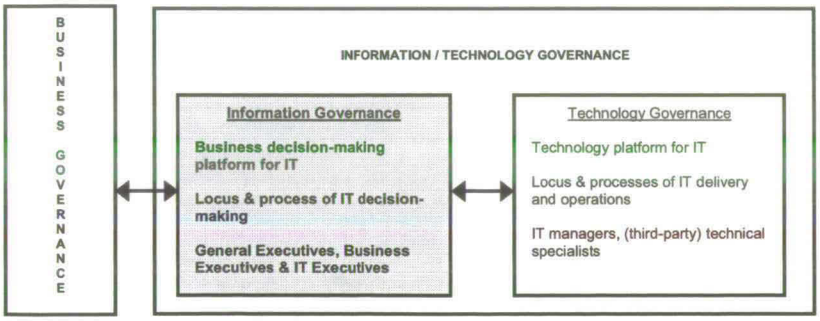

Figure 2.7. Positioning Information Governance.

Due to the heterogeneous nature of stakeholder constituencies, Information Governance needs to provide transparent ways for explicating and communicating stakeholder expectations, and (a) enable business and IT executives to integrate business and IT decisions, (b) implement and monitor key business and IT initiatives, (c) and track and learn from their effectiveness (Henderson & Lentz, 1994; Weill & Broadbent, 1998). Following the Information Governance framework, Information Governance is defined as:

The differentiation and integration of business and IT decision-making units, in order to provide direction to IT, towards the realization of the organization's goals.

In contrast, *Technology Governance* describes the technical platform for IT, concerned with the locus and process of IT supply and operations, and the involvement of IT management and/or (external-third party) IT specialists. Technology governance focuses on managing the delivery of services across the business, defining the technical architecture and infrastructure, and securing sources of supply (Figure 2.7).

The difference between Information Governance and Technology Governance is akin to Parker & Benson's (1988) discussion of enterprise-wide information management, i.e., a shift in management emphasis away from information *technology*, to the *business* importance and impact of IT. Technology Governance should be subordinate to Information Governance (Applegate et al., 1999; Brown & Magill, 1998; Parker & Benson, 1988; Strassmann, 1995). Furthermore, whereas elements of Technology Governance could be commissioned to a vendor or third party, Information Governance is organization-specific (Fitzgerald, 2000; Ross et al., 1996; Weill & Broadbent, 1998).

2.4.3 Organizational Development of the IT Function

A third reason for much of the confusion regarding the concept - and practice - of Information Governance is caused by the different organizational and technological developments in the IT organization. The discussion settles on the design of the IT function (McFarlan, 1973; Buchanan and Linowes, 1980; Rockart et al., 1996). One of the distinctive features of IT, is its heterogeneous nature. 'The' IT function comprises a wide variety of complex sub-functions. Different typologies under different terminologies have been proposed to cover the range of (sub-) functions (Figure 2.8).

McFarlan (1973) introduced three categories of IT functions: system operations, system development and system management. The rationale was based on the recognition that the task-environments of these activities were different. While system operations involve a series of interdependent tasks, emphasizing efficiency and reliability, system management involves administration tasks directed toward coordinating and controlling other activities. Buchanan and Linowes (1980) also developed a similar classification. Zmud (1984), however, concludes that this traditional classifications is based on a 'manufacturing' role of the IT function, and neglected the 'service' role in an environment of increased business competition and growing business demands. Consequently, Zmud (1984) extended McFarlan's (1973) initial typology by including several new categories. Contrary to McFarlan's (1974) task-based structure, Zmud (1984) describes a more product-based structure, in which activities are organized around end-products and services to the user-organization.

Dixon and John (1989), elaborating on the service role, argue that the IT function needs to be recognized as a knowledge function, integrating expertise of business and information technology. They contend that the IT function requires an external business-centered orientation. The functional orientation of IT activities is replaced with a business-oriented organization, focusing on: (a) management of technology, and (b) the management of the *use* of technology. Dixon & John (1989) point out that while these two management responsibilities should be separated, they should but not segregated. In a similar fashion, Benson (1996) argues for the division of IT functions into two separate, yet interconnected sub-functions: IT applications and IT infrastructure. The IT applications sub-function is concerned with the complete system life-cycle of applications. The IT infrastructure sub-function is focused on providing technology-specific facilities and infrastructures, and user-specific services to support business units.

Sambamurthy et al. (1994) extend the IT applications and IT infrastructure sub-functions with an IT project management sub-function, explicitly focusing on development activities. They provide empirical support for three sets of IT sub-functions: infrastructure, business applications, project management. Infrastructure decisions describe the establishment and maintenance of adequate capacities in hardware, software, data, and networks. Business application decisions refer to managing the inventory of current and future applications, setting priorities for application development and maintenance, and identifying new business applications. Project management describes the management of systems development activities.

McFarlan 1973	- System operations: physical hardware, maintenance, operations personnel - System development: analysis, design and programming of new applications, updating and maintenance of existing applications - System management: administrative aspects of planning, developing, operating and controlling information technology activities (incl. policy setting, selection of new applications and equipment, people resources, project planning, project control, and project audit)
Buchanan & Linowes 1980	- Operation (execution): hardware operation, telecommunications, system programming, system maintenance - Development (execution): data-base administration, applications programming, systems analysis, system documentation, user training - Control (of operation and development): providing security, setting priorities, standardizing tasks, accessing data, scheduling tasks, personnel planning, budgeting, evaluating products
Zmud 1984	- Delivery systems: maintenance of hardware, systems software, application software, operations support, telecommunications support - Systems development: system design and software development - Support center: internal consulting service, broker for packaged software, end-user and systems personnel training - Information center: internal consulting service and support facilities for end-user applications development - Research and development: monitor technological developments and technological forecasting - Technology diffusion: develop organizational infrastructure, manage system implementations and pilot studies - Planning: information planning, liaison with corporate planning, overall evaluation of organizational use of information systems - Internal auditing: standards development, adherence to controls - Administration: budgeting, personnel management, document management
Dixon & John 1989	- Management of technology: computer operations, infrastructure/networking, emerging technologies/R&D, technology planning - Management of the *use* of technology: systems development, end-user computing support, application planning
Sambamurthy et al. 1994	- Infrastructure decisions: establishment and maintenance of adequate capacities in hardware, software, data, and networks - Applications decisions: management of current and future applications, setting priorities for application development and maintenance, and identifying new business applications - Project management decisions: management of systems development projects.

Figure 2.8. Typology of IT functions.

Recently, Weill & Broadbent (1998), in discussing 'the new infrastructure', graphically summarize the different IT functions in a hierarchical *portfolio* of IT activities (Figure 2.9). Given the widespread proliferation and infusion of IT in organizations, involving e.g., technical platforms, shared IT services centers, and local business-embedded applications, the notion of a single homogenous IT function is obsolete. Weill & Broadbent (1998) indicate that contemporary organizations consists of a portfolio of different interdependent IT functions and technical capabilities, some of which are allocated to the business, or to third party vendors. The IT infrastructure is the base foundation of IT capabilities, delivered as reliable shared services throughout the organization, and centrally directed, usually by corporate IT management (Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998). The purpose of the IT infrastructure is to enable organization-wide data sharing and cross-business integration. The infrastructure capability describes the degree to which its resources are shareable and reusable (Weill & Broadbent, 1998). In contrast, local business-embedded applications are concerned with product-service-specific needs in order to meet the changing demands of the business and its customers, usually directed by local business management (Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998). These applications utilize the infrastructure services and are built on the shared technical platforms.

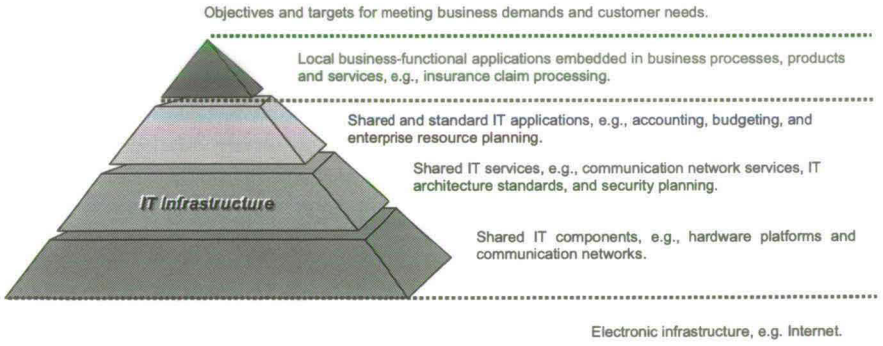

Figure 2.9. Structure of the IT portfolio (Adapted from Weill & Broadbent, 1998).

The notion of an IT portfolio captures the pervasiveness and interdependence of IT functions within and among organizations. The IT portfolio also indicates the importance and the need for joint decision-making and partnerships between business and IT managers, and the policies and architectures that bind the technical components into reliable services. The proliferation and competing demands of the IT function describe the complexity associated with the business decision-making and the technical architectures and policies for IT, which has led to much contemporary rhetoric on the 'best way' to organize the IT function.

2.4.4 Contemporary Rhetoric Rekindling a Classical Debate

Over the past decade, studies indicate that Information Governance is messy and ephemeral phenomenon, emerging in ever-new shapes with growing complexity (cf. Brown, 1997; Brown & Magill, 1994; Feeny et al., 1989; Sambamurthy & Zmud, 1999). The foregoing developments in the IT function, and the terminological confusion, have led to much rhetoric and speculation on the 'best way' to organize the IT function, and in the process have rekindled the classical 'centralization versus decentralization' (King, 1983; McFarlan, 1973; Brown, 1997). The academic literature and business press is replete with topics concerning, e.g., 'the new centralization' (Maglitta & Mehler, 1992), 'the centrally decentralized IT organization' (Von Simson, 1990), 'the recentralizing of IT' (Laberis, 1998), and the 'new federal IT organization' (Rockart et al., 1996; Earl, 2000). The discussion revolves around the locus of decision-making for IT, i.e., formal allocation of IT decision-making as vested in - central or decentral - organizational positions (Venkatraman et al., 1993; Sambamurthy & Zmud, 1999).

However, as Mintzberg (1979) so eloquently points out:

> *"The words centralization and decentralization have been bandied about for as long anyone has cared to write about organizations. Yet, they represent probably the most confused topic in management. These words have been used in so many different ways, that they have ceased to have any useful meaning".*
>
> *"Much of the confusion seems to stem forth from the presence of a number of different concepts fighting for the for recognition under the same label. Perhaps it is the presence of two or even three babies in the same bathwater that has obscured the perception of anyone".*

Huber et al. (1987) describes centralization of decision-making as the nearness of decision-making to the topmost level of the organization's hierarchy. The question remains, however, what 'nearness' and 'topmost level' are. In order to provide a more objective assessment of the degree of centralization, Mintzberg (1979), provides the following definition of centralization:

> *When all authority for decision-making rests at a single point in the organization - ultimately in the hand of one person or one group -, the structure is centralized. To the extent that decision-making is dispersed throughout the organization, the structure is decentralized.*

Ribbers (1980; 1996) provides a similar definition of centralization:

> *A structure is centralized, if with regard to a certain subject, one decision is made that applies to the complete organization. Under these conditions there is a single decision-making unit. Alternatively, a structure is decentralized, if with regard to a certain subject, different decisions are made independently and simultaneously. Under these conditions, multiple independent decision-making units exist.*

The confusion surrounding the 'centralization versus decentralization' debate refers to '*a certain subject*' in the definition provided by Ribbers (1980; 1996), and stems forth from the terminological confusion surrounding Information Governance. Mintzberg (1979) indicates that the term decentralization is used in two fundamentally different ways, referring to two different *subjects*, i.e., informational decision-making and physical services. While the former refers to the dispersion of decision-making, the latter refers to the physical dispersal of services and products. King (1983) also notes this difference in the centralization of IT, and distinguishes between:

Centralization of control: Centralization is the concentration of *decision-making* in a single and central organizational unit; decentralization implies that decisions are made at multiple levels in the organization. The locus of control varies between a central IT department and decentral IT departments.

Centralization of location: Centralization concerns the *physical location of facilities*. A centralized physical location has all facilities in one place. Decentralized physical location distributes facilities over different locations. A service center can be situated at one location, or different service centers can be set up at different locations. Likewise service delivery can be provided from a single, or multiple locations.

In this study, the definition, as provided by Mintzberg (1979) and Ribbers (1980; 1996), and described in King's (1983) first interpretation, is used. The term centralization - or decentralization - will refer to centralization - or decentralization - of decision-making.

The 'centralization vs. decentralization' debate is also concerned with the trade-off between (a) efficiency and low-cost under centralization, versus (b) effectiveness and flexibility under decentralization (King, 1983). Different rationales are documented in the literature in support of either centralization or decentralization (Table 2.2), yet research is inconclusive (Brown & Magill, 1998; Eisenhardt & Zbaracki, 1992; Huber et al., 1987). In general, it is assumed that centralization leads to greater specialization, consistency, standardized controls, while decentralization provides local control, ownership and greater responsiveness and flexibility to business needs (King, 1983; Brown, 1997; Ribbers, 1996).

However, the flexibility rationale for decentralization may lead to variable standards, which ultimately result in lower flexibility. And the specialization rationale for centralization incurs risks due to 'bounded rationality' (Simon, 1961), and 'information overload' (Mintzberg, 1979). The potential risk in contemporary business environments is that either centralization or decentralization fit the organization into a fixed structure of decision-making. The challenge is therefore to balance the benefits of decentralized decision-making and business responsiveness, and the benefits of central control and standardization of IT activities. As Mintzberg (1979) points out, centralization and decentralization should not be treated as absolutes, but as two ends of a continuum.

Table 2.2. Strengths and weaknesses of centralization and decentralization.

Centralization		**Decentralization**	
Strengths	*Weaknesses*	*Strengths*	*Weaknesses*
Specialization	Costs of communication	Local control	Lack of specialization
Consistency and control of standards	Costs of compromise	Business ownership	Lack of synergy
Long-term focus	Unresponsive (short term)	Short-term focus	Costs of duplication
Synergy	'Information overload' risks	Flexibility	'Variable standards' risks

Underlying the debate of 'centralization versus decentralization' are two assumptions. The traditional debate is based on a 'machine view' or 'rational' perspective of the organization, in which choices are reduced to one of internal efficiency and effectiveness (March & Simon, 1958; Morgan, 1986; Ribbers, 1996). The machine view assumes a 'closed system' of goal consonance, and agreement on the means for achieving goals. King (1983) argues, however, that there are important differences among factions within organizations, leading to the presence of conflict and disagreement over organization goals and the means for achieving them. Organizations usually have many diverse social groupings, and multiple organizational tasks and objectives (March & Simon, 1958). The key stakeholder constituencies in Information Governance include (Figure 2.10): Corporate (IT) management, Local IT Management and Business-line management (Brown & Magill, 1994; Sambamurthy & Zmud, 1999).

A behavioral view of the organization suggests that the debate concerning 'centralization versus decentralization' is used to further the goals of specific organizational actors in a 'satisficing' - not optimizing - manner (Simon, 1961), in ways that might not help to meet organizational goals (Cyert & March, 1963). King (1983) concludes that the basic question has never been 'which way is the best?'. Rather, it is usually 'who's way is it going to be?'. According to King (1983) and Strassmann (1995) economic issues are frequently weapons in the discussion over policy that serves political ends.

The second assumption underlying the classical debate relates to the nature of IT function. As described in Section 2.2.3, IT is not a homogeneous function, but consists of a portfolio of different IT capabilities. The terms centralization and decentralization provide a dichotomy that is meaningless when applied as a generality to decision-making for IT. The centralization or decentralization can be applied to each of the main IT capabilities (Sambamurthy & Zmud, 1999), yielding distinct patterns of structural differentiation in decision-making for IT (Table 2.3).

Table 2.3. Structural differentiation in decision-making for IT.

Patterns / IT functions	I	II	III	IV	V	VI	VII	VIII	IX	X
Applications	CM	DT	CM	DT	DB	CM	DB	DT	DB	DT/DB
Development	CM	CM	DT	DT	CM	DB	DT	DB	DB	DT/DB
Infrastructure	CM	CM	CM	CM	CM	CM	CM	CM	CM	DT/DB

CM = Centralized Corporate (IT) Management (Corporate level);
DT = Decentralized Division-IT management (LoB/SBU level);
DB = Decentralized Business-Division Management (LoB/SBU level).

These patterns in Information Governance depict 'archetypes' for the locus of IT decision-making (Sambamurthy and Zmud, 1999). Patterns *I* and *X* describe the extremes in the structural differentiation of decision-making for IT, i.e., complete centralization or complete decentralization. The latter consists of 5 sub patterns. Patterns *II* through *IX* describe hybrid patterns, in which IT decision-making is differentiated across central and decentral organizational units, i.e., across the three main stakeholder groups involved in strategic decision-making for IT. This 'federal' model involves the centralization of decision-making for IT infrastructure, and the decentralization of decision-making for IT applications and IT development (Zmud et al., 1986; Sambamurthy & Zmud, 1999).

These different patterns have also been reported in literature as trends in organizations throughout the past decades (Figure 2.10). In the 1950s, accounting and controller departments mainly used electronic computers. Some of these departments were centralized, while others were decentralized, and decision-making defaulted to those departments that made use of the technology (Simon, 1954). The benefits gained from automating the business's processes and functions led most organizations to integrate and centralize their technologies in the 1960s and 1970s. Technological developments in the form of mainframe systems also facilitated a centralized Information Governance model. Specialists skilled in a number of hardware and software fields were required, and often reported to a central IT group. This central or corporate IT group primarily served a manufacturing role in a function-oriented organization (Zmud, 1984).

By the mid 1980s, both the business and IT environments had changed significantly. Business markets became more complex and competitive. Businesses adopted divisional structures, each with their own products and market services, and concurring responsibilities and accountabilities. The proliferation of IT also became more complex with the dispersion of IT to the business units, and the decentralization of decision-making for IT. Local IT managers were given authority over IT in order to respond to the local needs of the business in the competitive environment (Zmud, 1984).

In 1990s, as companies experienced the demise of traditional geographic and business boundaries, volatile markets, and the emergence of 'the new infrastructure' (Weill & Broadbent, 1998), decision-making for IT was again resorted to a central IT group. The title and function of CIO (Chief Information Officer) emerged on organizational charts, and many organizations were characterized by both (a) a corporate IT department, often led by a CIO or IT director, and (b) several local business (-line) IT departments. Having re-centralized IT in the early to mid 1990s, recent evidence - albeit anecdotal - suggests that IT is again being decentralized in IT-intensive business environments (Dalton, 1999; Weston, 1999; Klein, 1999).

Currently, a hybrid model of Information Governance is the dominant form in many organizations (Hodgkinson, 1996; Feeny, 1997; Sambamurthy & Zmud, 1999). Already described by McFarlan (1973) and forecasted by King (1983), external and internal pressures seem to be moving organizations

toward a 'core-peripheral' approach, in which the IT infrastructure is directed by Corporate IT management, and local business applications are managed by business or IT management. At the 'core' of the organization, IT infrastructure decisions are centralized and allocated to the corporate unit, whereas IT application decisions are decentralized and allocated to the different operational business units at the organization's 'periphery'.

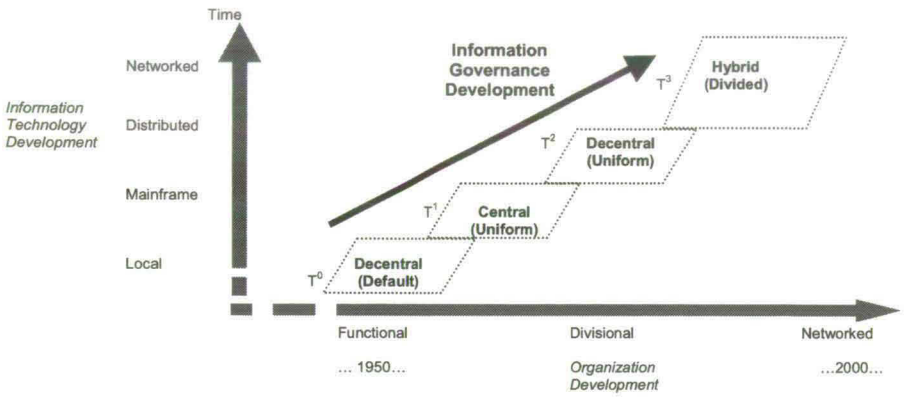

Figure 2.10. Developments in Organization, Information Technology and Information Governance[18] (Based on Applegate et al., 1999; Boynton et al., 1987; Zmud, 1984).

2.5 Previous Studies

Previous studies have sought an answer to the 'best way' of designing Information Governance, recognizing that this 'best way' is contingent upon internal and external environmental factors (Brown & Magill, 1994; Sambamurthy & Zmud, 1999). The main focus is on the relationship between the characteristics of the organizational context and models of Information Governance (Figure 2.11). The basic assumption is that the independent variables relating to the organizational context can be identified that cause sources of variation in the dependent variable, i.e., locus of IT decision-making (Brown and Magill, 1998).

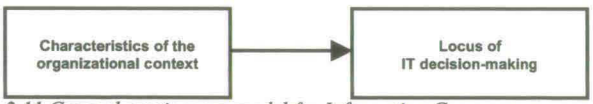

Figure 2.11 General contingency model for Information Governance research (Adapted from Ahituv et al., 1989; Brown & Magill, 1994; Weill & Olson, 1989).

The basic contingency model is rooted in the contingency theory of organization and management[19] (Lawrence & Lorsch, 1967). The development of contingency theory is a reaction to the classical organization theories (Fayol, 1930; Taylor, 1947), which sought the one best way to organize in all situations. The contingency theory, attempts to understand the interrelationships within and among organizational subsystems, as well as, between the organizational system as an entity and its environment (Mintzberg, 1979).

Central to the contingency theory is the notion of 'fit', i.e., the proposition that the design of an organization must be internally consistent and fit its context, if it is to be effective. Drazin & Van de Ven (1985) describe three forms of measuring fit: (a) selection, (b) interaction and (c) systems. The selection approach describes fit as the congruency between the organizational context and

[18] This figure does not imply that every organization develops through these stages, or that every contemporary organization is networked, and makes use of networked IT systems.

[19] The contingency theory of organization and management will be discussed more elaborately in Chapter 4. This section briefly outlines the major traits of the contingency theory, in order to provide a background of previous studies.

organizational design, without examining the performance implications of the context-design relationship. The interaction approach describes fit as an interaction effect between the context and structure of an organization on performance. The selection and interaction approach focus on single contextual factors and single structural characteristics. The systems approach addresses simultaneously multiple contextual, structural and performance characteristics in a holistic manner. The systems approach is also referred to as the multiple contingency approach (Gresov, 1989). The multiple contingency approach states that organizational designs are attempts to respond to multiple, conflicting contingency factors. The purpose of the multiple contingency theory is to address contingency factors in a holistic 'gestalt' fashion (Gresov, 1989; Miller, 1978).

Previous studies were a reaction to the classical 'centralization versus decentralization' debate. According to Chervany & Olson (1980), the primary weakness of this debate was that no organizational constraints were presumed. King (1983) was one of the firsts to acknowledge that the technicalities of 'centralization versus decentralization' in isolation are irresolvable, and argued that the prevailing norms of the organization can provide guidance. Brown & Magill (1994) and Sambamurthy & Zmud (1999) conclude that over the past decade, the contingency approach has become a doctrine for research on Information Governance.

2.5.1 Information Governance Studies: 1980 - 1989

In a seminal study, Garrity (1963) found that an important success factor was whether the organization of the computer function corresponded to the general organization structure. Garrity (1963) concludes that success is not so much based on insistence of 'functional rights', but on the sharing of knowledge and effective working relationships between technical and non-technical personnel. This pioneering study reinforced the conception of a contingency approach for Information Governance, as suggested by King (1983) and Olson & Chervany (1980), and led to several studies examining the relationship between the organizational context and models of Information Governance.

The first reported empirical studies during the 1980s examined the relationship between single organizational context variables and single Information Governance design variables (see also Appendix B). Olson & Chervany (1980) examined the relationship between the organizational context and the Information Governance design, but found no significant relationships. No differences were found for size (employees) and type of industry (i.e. banking vs. manufacturing). The authors conclude that the sample size (43 organizations) was too small.

Contrary to Olson & Chervany (1980), Ein-Dor & Segev (1982) did find significant relationships between organizational context and Information Governance design. Findings indicate that centralization of organizational decision-making is associated with centralization of IT operations and IT development. An inverse relation was found between size and centralization IT development and organizational decision-making. A positive relationship was found between the degree of centralized organizational decision-making and the rank of the MIS director. Ahituv et al. (1989) also found a positive relationship between the centralization of decision-making and centralization of IT. No differences were found for size or industry.

Tavakolian (1989) examined the relationship between competitive business strategy[20] and the degree of centralized IT decision-making. Contrary to prior studies, Tavakolian (1989) focused on a strategic variable at the business-unit level. Prior studies were focused on structural variables at the corporate level. The results indicate that a defender ('conservative') strategy is associated with a more centralized Information Governance design. A prospector ('innovative') strategy is associated with a more decentralized Information Governance design.

The first reported studies yield significant relationships for three organizational context variables: business strategy, organizational size and business governance (organizational decision-making) structure. Centralized Information Governance is associated with a defender strategy, centralized business governance, and small organizational size. Decentralized Information Governance is associated with a prospector strategy, decentralized business governance, and large companies.

[20] Miles and Snow (1978) distinguish the following competitive strategies: (a) defender strategy, conservative strategy engaging in little product innovation, (b) prospector strategy, aggressive strategy engaging new product/market development, (c) analyzer strategy, moderate strategy engaging in fewer innovations than a prospector and less stable than defender, (d) reactor strategy, no distinct competitive strategy, reactive actions.

However, the evidence is empirically weak, and the early studies employed the traditional centralization-decentralization dichotomy for individual IT functions. Consequently, a second wave of empirical studies was conducted during the 1990s. These studies attempted to identify relationships between multiple organizational and information technology context variables and different models of Information Governance (see also Appendix C).

2.5.2 Information Governance Studies: 1989 - 1999

Feeny et al. (1989) examined the relationship between numerous organizational context variables, including characteristics of IT, and Information Governance design, as well as the relationship between Information Governance and IS performance. The results indicate that centralized (vs. decentralized) Information Governance was associated with centralized (vs. decentralized) business governance. The dominant model was a federal design of Information Governance, associated with a multidivisional organization. IT heritage, as measured by the 'history of IS management crises, successes and failures', was associated with changes to the Information Governance design. Regarding IS performance, little difference was found in levels of efficiency across the sample organizations. Differences in levels of effectiveness were associated with the extent to which the Information Governance design fit the key characteristics of the host organization.

In a survey of 200 of the largest companies in the UK, Hodgkinson (1996) found that 88% had a federal model for Information Governance. Building forth on the conclusion of Feeny et al. (1989) that a variety of options exist within the federal mode, Hodgkinson (1996) examines the relationship between corporate management style and two distinct federal models of Information Governance, i.e., 'strong federal' and 'weak federal'. 'Strong federal' is described by a strategic leadership style of the corporate IT function, characterized by e.g., pro-actively increasing IT performance throughout the group, IT director reporting to executive board, formal group-wide IT policy/standards, and career development of IT professionals. The 'weak federal' is described by a strategic guidance style of the corporate IT function, characterized by e.g., re-activeness towards low performing IT, loose reporting relationships, variable standards of IT professionalism, and minimal group-wide IT policy/standards. Results indicated that a 'strong' federal model was associated with a strategic planning corporate management style, while a 'weak' federal model was linked to financial control corporate management style.

Commenting on the contradictory and empirically weak support of the 4 earlier studies, Brown & Magill (1994) develop a model of antecedents for explaining different IT decision-making designs. They identify 45 variables categorized in four groups. The findings indicate significant relationships between *decentralized* Information Governance and (a) 'unrelated diversification' corporate strategy[21], (b) decentralized organization, (c) local autonomy culture, (e) IT management expertise. *Centralized* Information Governance is associated with (a) 'related diversification' corporate strategy, (b) centralized organization, (c) central direction culture, and (d) CIO member of top management team. *Hybrid* governance is associated with (a) a corporate strategy of related diversification, (b) an increasingly unstable environment, (c) CEO's 'restructuring vision'.

Similar to Feeny et al. (1989), the results indicate that dissatisfaction with IT performance causes changes in the model of Information Governance. Results also indicated that different firms in the same industry have different models of Information Governance, and that firms operating in different industries have similar models of Information Governance, indicating that internal organizational characteristics seem to be a dominant antecedent of Information Governance design. An unexpected finding, according to Brown & Magill (1994) was the need for management partnerships with, and the willingness to change by the IT organization in a hybrid model of Information Governance.

Based on the findings of Brown & Magill (1994), Brown (1997) addresses the question why firms adopt a hybrid model for Information Governance, in which centralized and decentralized models co-exist for system development *at the business-unit level*. Results indicate that decentralized IT development governance is associated with decentralization business governance, high business unit

[21] Corporate strategy addresses the choice of businesses the company will compete in, including the number of business engaged in, as well as how well those business fit together: single business, vertical integration, related diversification, unrelated diversification (Rumelt, 1974).

autonomy, differentiation strategy[22], industry instability, and high information-intensity. Perceived deficiencies of IT capabilities and a high emphasis on change are associated with hybrid models for Information Governance. The business perception of IT is an important factor in developing a hybrid model. This is consistent with the earlier findings by Feeny et al. (1989) and Brown & Magill (1994) on the willingness to change and dissatisfaction with IT performance.

Based on secondary data analysis, Sambamurthy & Zmud (1999) examined the relationship between multiple contingencies and Information Governance. They identify three contingency factors[23]: corporate governance (centralized/decentralized decision-making), economies of scope (diversification and exploitation), absorptive capacity (line-IT knowledge). Referring to Gresov's (1989) multiple-contingency approach, three scenarios are described: reinforcing contingencies, conflicting contingencies and dominating contingencies. All three hypotheses were supported:

1. Organizations facing reinforcing contingencies regarding corporate governance, scope, and absorptive capacity are likely to exhibit a centralized or decentralized design;
2. Organizations facing conflicting contingencies regarding corporate governance, scope, and absorptive capacity are likely to exhibit a federal design;
3. Organizations facing dominating contingencies regarding corporate governance, scope, and absorptive capacity are likely to exhibit a centralized or decentralized design.

2.5.3 Conclusion

The first set of empirical studies (1980 - 1989) reported significant relationships for three organizational context variables: (a) business strategy, (b) business governance, and (c) organization size. The results indicate that centralization is associated with a defender strategy, centralized business governance and small organization size. Decentralization is associated with a prospector strategy, decentralized business governance, and large organization size. The second set of empirical studies (1989 - 1999), reconfirm the findings of the earlier studies, with the addition of the following contingency factors:

- Corporate strategy: related diversification and market relatedness associated with centralization
- Information intensity of products/services: high information intensity associated with decentralization;
- Environment stability: stable environment associated with centralization;

Furthermore, IT performance and management vision lead to changes in the existing model, and conflicting contingencies lead to a federal - hybrid - model. Specifically, the decentralization of decision-making for IT applications and IT development is contingent upon business strategy (differentiation strategy), business governance (decentralized model), high information-intensity, and low environmental stability (Table 2.4).

Table 2.4. Summary of previous studies: Contingency factors and models of Information Governance.

Information Governance Contingency Factors	Centralized Model	Federal Model	Decentralized Model
Corporate strategy	Related Diversification/Markets		Unrelated Diversification/Markets
Business strategy	Cost leadership	*Differentiation**	Differentiation
Business governance	Centralized	*Decentralized**	Decentralized
Organization size	Small		Large
Information-intensity	Low	*High**	High
Environment stability	High	*Low**	Low

[22] Business strategy addresses how the company will compete in each of its businesses: (a) low-cost strategy; (b) product/service differentiation strategy; (c) focus strategy (Porter, 1980). (See also Chapter 4).

[23] The terminology used reflects contemporary developments regarding 'corporate governance', 'acquisition and mergers', and 'knowledge management'. Absorptive capacity refers to the ability to develop relevant knowledge bases, recognise valuable external information, make appropriate decisions, and implement effective work processes and structures (Cohen and Levinthal, 1990).

An *emerging*[24] finding of the studies indicates that perception of these factors by organizational units and individuals is important. In their study, Brown & Magill (1994) discovered that perceived deficiency of IT capabilities under a decentralization resulted in re-centralization of IT development, led by business management. Similarly, in a company where the external environment was rated as unstable, the CEO personally championed a 'new model' of Information Governance (Brown & Magill, 1994).

A recurring discussion in previous studies revolves around the causal relationship between organizational context and models of Information Governance (Olson & Chervany, 1980; Ein-Dor & Segev, 1982; Brown, 1997). The contingency theory of organization and management has indeed been criticized for its deterministic nature by both organization (Drazin & Van de Ven, 1985; Morgan, 1986) and IS research communities (Weill & Olson, 1989). In the only single-case, longitudinal study, covering almost 10 years, Brown (1997) provides evidence that changes in the organizational context lead to changes in Information Governance.

2.6 Critique of Previous Studies

The critique of previous studies is based on several theoretical assumptions and the limitations of prior research. The first limitation refers to the limited amount of empirical studies conducted on Information Governance. Between 1970 and 2000, only 9 empirical studies were conducted on Information Governance. This limited amount hardly provides for any strong foundation from which reliable conclusions can be drawn. The summary of previous studies (Table 2.4) should therefore be interpreted as tentative. Furthermore, over the past 5 years no empirical study has been conducted on Information Governance. The study reported by Sambamurthy & Zmud (1999) was based on a secondary analysis of data collected in 1989. The study by Brown (1997) was based on a study conducted in 1993 (Brown & Magill, 1994). The conclusions drawn are therefore not only tentative, they may even be outdated. No empirical study has been conducted on Information Governance in contemporary business environments. Sambamurthy & Zmud (2000) conclude:

> *"Today, however, there are increasing signs that this accumulated wisdom might be inadequate. There seems to be a growing gap between scholarly research and contemporary practice".*

A second limitation of previous studies revolves around the 'new' federal model for Information Governance. Already forecasted by Zmud et al. (1986), different studies indicate that this federal model is the dominant Information Governance practice in contemporary organizations (Feeny et al., 1989; Hodgkinson, 1996; Sambamurthy & Zmud, 1999). Robson (1997) states that the federal model is now the norm. The federal model is also propagated as the best model, 'capturing the best of both - centralized and decentralized - worlds' (Von Simson, 1990). Rockart et al. (1996) describe the federal model as one of the fundamental imperatives of IT in the late 1990s, and urge organizations to adopt the federal model, regardless of organizational contingencies. Recently, Earl (2000) argues that every company needs to build a degree of IT federalism. Are these studies implying that a 'one best way of organizing' exists after all?

In contrast, Peppard & Ward (1999) state that while appealing at present, this federal model is more of a theoretical construction, than a direct practical solution. The problem, according to Sauer & Yetton (1997), is that on the surface, the federal model seems to provide a solution to the competing demands of corporate efficiency and business flexibility. However:

> *"...the structure it creates depends on IT managers' ensuring that activities of the different work groups, which have competing interests, are integrated across the organization. The reality is that local IT units tend to be 'captured' by the goals of the business unit, while the central IT unit tends to become divorced from the business".*

Hodgkinson (1996), however, argues that studies have tended to ignore the existence of this 'gray area' between the two extremes of centralization and decentralization, and as a result, there is a lack of

[24] An emerging finding is defined as a result of a study not previously encountered and/or anticipated in the research outcome.
* Decision-making for IT applications and IT development contingent on ***business-unit level*** factors.

comprehensive understanding regarding the federal model for Information Governance, and subsequently, organizational and managerial guidelines. More importantly, while research insists on the dominance and importance of the federal model for Information Governance, previous studies fail to specify which of the eight patterns apply to federal Information Governance (see Table 2.2). The federal model for Information Governance is not a single model, but consists of different patterns for dividing and coordinating strategic decision-making for IT. Nevertheless, no empirical study has addressed the complexity of this hybrid approach for Information Governance.

The complexity of the federal model for Information Governance alludes to a third limitation in previous studies. While previous studies focus on the differentiation of decision-making for IT, they do not address the integration of decision-making for IT. In terms of Mintzberg (1979), previous studies address the division responsibilities, but fail to take into account coordination to accomplish activities. Simon (1960), in describing the design of decision-making systems, provides the following metaphor:

> *"It will be like ship design. There is no use in one group of experts producing the hull, another the design for the power plant, and a third the plans for the passenger quarters, unless great pains are taken at each step to see that all these parts fit a seaworthy ship".*

Federal models of Information Governance, in particular, introduce a 'new division', in which the decision-making actions of individual units are interdependent, thus requiring coordination, especially considering the dynamic task environments, and the different 'semantic models'. Previous studies, however, assume that once IT decision-making is allocated to the different organizational units, coordination will follow automatically through hierarchical lines of reporting (Ahituv et al, 1989; Brown & Magill, 1994; Ein-Dor & Segev, 1982; Tavakolian, 1989).

Previous studies do in fact identify an increased need for coordination in a hybrid model for Information Governance. Brown (1997) reports that organizations adopting a hybrid model indicate the need for management partnerships between business and IT. Luftman & Brier (1999) report that several integration inhibitors exist between business and IT management, including the lack of (a) personal relationships between business and IT management, (b) prioritization of IT investments and decisions, (c) IT commitment and support, and (d) shared understanding (Figure 2.12).

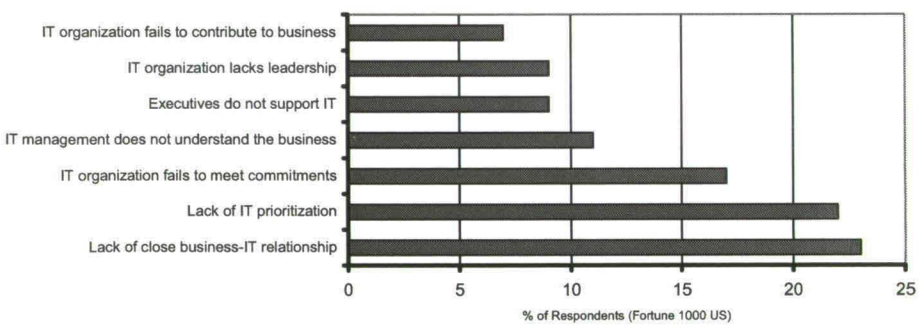

Figure 2.12. Integration Inhibitors (Adapted from Luftman & Brier, 1999).

In a seminal study on top-management and computer profits, Garrity (1963) concludes that success is not so much based on insistence of 'functional rights', but on the sharing of knowledge and effective working relationships between technical and non-technical personnel. Sambamurthy & Zmud (1999), in summarizing the limitations of their study, conclude:

> *"In terms of future research directions, there is a great need to better understand the dynamics of organizational adaptation of IT governance modes in response to changing organizational and industry contingencies. How are coordination mechanisms utilized along with the locus of IT decision rights to respond to the pressures of evolving multiple competing pressures? We think that this is a fascinating and fertile ground for future research".*

More recently, in discussing the new organizing logic for IT, Sambamurthy & Zmud (2000) call for research on '*integration architectures*', arguing that the most significant organizing mechanisms will be associated with integration, rather than differentiation. Ribbers (1992) concludes that the main dilemma is the differentiation *and integration* of decision-making for IT, in order to utilize IT effectively.
Up until now, however, no empirical study has been conducted on the differentiation *and integration* of strategic decision-making for IT. Building forth on Lawrence & Lorsch (1967), Lorsch & Allen (1973) discuss the complexity of business governance and indicate:

> *"Our study suggests that the real difference between a centralized and decentralized organization is something much more complex than just its patterns of decision-making. If these labels are to capture the realities of how complex organizations operate, they must refer to systems of organizational variables which include division of work and differentiation; the integration among divisions and the headquarters; the types of integrative structural devices used, as well as the information flows and decision-making processes operating within the organization".*

Lorsch & Lawrence (1972):

> *"Another shortcoming in the traditional views about centralization and decentralization is a failure to recognize that the issue is really one of a vertical division of labor and coordination. Therefore, it is not just a question of dividing responsibility up and down the hierarchy, but it is also a question of organizing the flow of information and coordinating devices..."*

In order to gain understanding of the complexities regarding Information Governance in contemporary IT-intensive business environments, empirical research needs to address both the differentiation and integration of strategic decision-making for IT. The *basic premise* of this study is that allocation and differentiation of IT decision-making does not resolve the need for effective coordination, and hence, requires the use of mechanisms to integrate decision-making for IT, in order to realize business value from IT.

Previous research assumes, furthermore, that an organization's 'official' Information Governance is an 'actual' reflection of decision-making for IT. The prior studies (and the researchers) assume that there are no differences between 'espoused theories' (what we say about how we act) and 'theories in use' (what our actions actually reveal) (Argyris & Schon, 1978). The distinction is similar to Mintzberg's (1978) discussion of 'intended' versus 'realized' strategies, and Miller's (1988) description of 'emergent structures' - actually used procedures -, and 'institutional structures' - policy manuals and organization charts.

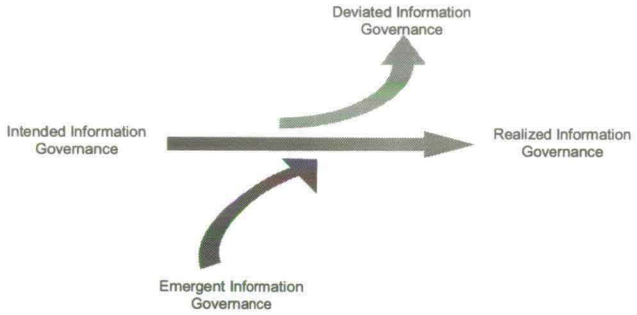

Figure 2.13. Intended versus Realized Information Governance.

The IS community has recently also recognized this distinction (Chan et al., 1998; Ciborra & Jelassi, 1994; Orlikowski, 2000). The formally intended allocation of IT decision-making therefore need not coincide with the actually realized decision-making for IT (Figure 2.13). As Keen (1991) points out, managers may 'delegate' IT decision-making, while others 'influence' IT decision-making. Decision-

making for IT is not only dictated by formal organizational positions (Venkatraman et al., 1993), but also by the power and expertise to influence and participate in decision-making over IT. Brown & Magill (1994) provide preliminary evidence that stakeholders outside the Information Governance 'triangle of command' influence decision-making for IT. Nonetheless, no empirical study has focused on the 'theories in use' regarding Information Governance.

A second assumption underlying previous studies involves the relationship between the design and outcome of Information Governance. Previous studies focus on the *context* and *design* of Information Governance, to the exclusion of assessing *realized* IT performance improvements or effectiveness. These studies assume that a fit between the context and locus of IT decision-making automatically leads to effective performance. Sambamurthy & Zmud (1999) argue that Information Governance is a prerequisite for developing IT-based innovation, yet, IT-based innovation is not assessed. Except for the study by Feeny et al. (1987), no other study was found relating the design of Information Governance to some measure of performance or effectiveness. Weill & Olson (1989) conclude that this is typical for contingency-based IS research. Previous studies are more related to congruency theories, which assess context-design predictions, instead of, contingency theories that state performance implications (Drazin and Van de Ven, 1985). Brown & Magill (1998) point out:

> *"Like other MIS researchers, we assumed that a context-design fit results in better performance. No related MIS study has included a performance variable, and studies that take into account performance variables are clearly needed".*

Reviewing the limitations and assumptions of previous studies, it is perhaps evident why Brown & Magill (1998) conclude that despite 30 years of research and management theories, there are still 'gaps' in our knowledge, and there is an absence of empirically-based guidelines. Arguably, previous studies have not adequately tapped into the 'historical richness' of organization and management reference disciplines.

2.7 Specification of the Research Problem & Questions

In the introduction (Chapter 1), an outline of contemporary developments and imperatives, and the general problem of Information Governance was described. In this chapter, the concept, development and previous studies on Information Governance were discussed. The research problem was generally described as the lack of comprehensive understanding with regard to the organizing logic of Information Governance. In light of the foregoing discussion on the limitations and assumptions of previous studies, the research problem can now be formulated more precisely. The lack of comprehensive understanding with regard to the organizing logic for Information Governance is due to the limited empirical evidence, and the weak - often trivial - foundation from which reliable conclusions can be drawn for theory advancement and design of Information Governance.

More specifically:

- A limited amount of empirical research has been conducted up until the early to mid 1990s. There is no empirical evidence regarding Information Governance in contemporary IT-intensive business environments;
- The complexity of 'the' federal Information Governance model remains concealed. There is no empirical evidence regarding the different patterns in the differentiation of decision-making structures for IT;
- The nature and types of integration mechanisms utilized and relevant to the coordination of decision-making for IT is likewise limited. There is no empirical evidence regarding Information Governance integration from which any conclusions can be drawn;
- The realized or operational design of Information Governance is not addressed in previous studies;
- Similarly, the outcome - performance impacts - of Information Governance is not addressed in previous studies.

In the introduction, it was also reported that Information Governance is a perennial item on the agendas of both business and IT executives as they seek to liaise IT with the ever-changing business environment. Executives often regard this as the issue that most impedes their organization's ability to realize business value from IT investments (Luftman & Brier, 1999; Sauer & Yetton, 1997; Weill & Broadbent, 1998). The problem becomes increasingly vexing when considering IT decision-making in

contemporary IT-intensive business environments (Demkes, 1999; Toppen, 1999). Moreover, as Sambamurthy & Zmud (1999) and Davenport & Markus (1999) indicate, there seems to be a growing gap between empirical research and contemporary organizational practices. The emergence of these organizational contexts thus indicates an additional 'catch 22' problem:

- Given our incomplete and inadequate framing of Information Governance, we are unable to provide organizations with any adequate directions for improving Information Governance;
- Empirical research regarding Information Governance is lagging behind on contemporary organizational practices.

These theoretical, empirical and practical problems demand that the design logic and strategies for Information Governance be re-examined. Information Governance is an organization design problem *par excellence* (Simon, 1960; De Leeuw, 1990). Consequently, developing empirically based insight on Information Governance in contemporary IT-intensive business environments is not solely a theoretical exercise, but is of practical value and relevance as well. There is a need to reshape the design principles underlying the classical conceptualization of Information Governance, and in so doing, we may provide directions on how organizations could effectively differentiate and integrate decision-making for IT.

These research problems and research objectives subsequently call for the specification of the research questions (see Section 1.3) underlying this study. The research questions are:

1. ***How and why is decision-making for IT divided in the federal model for Information Governance?***

   1.1. Who are the primary stakeholders involved in strategic decision making of IT?

   1.2. Why do organizations differentiate strategic decision-making for IT?

2. ***How and why is decision-making for IT coordinated in the federal model for Information Governance?***

   2.1. What (types of) coordination mechanisms are used to integrate IT decision-making across stakeholder constituencies and (intra-) organizational boundaries?

3. ***How is the division and coordination of decision-making for IT associated with business value appropriation from IT?***

   3.1. How can organizations improve their design of Information Governance?

These are the primary research questions that subsequently guide this study design. The research design is discussed in Chapter 3.

Chapter 3: Research Design

The essence of the man made sciences - whether engineering, medicine or management - is design
– Herbert Simon

3.1 Introduction

This chapter addresses the research design of this empirical study, not to be confused with the specific research methods & techniques for data collection and data analysis. These are described in Chapter 5. Every empirical study requires an explanation of the underlying research design, allowing the explication of evidence from the research questions to the conclusions of the study (Benbasat et al., 1987). The research design describes the overall configuration for organizing the research activities, in ways that are most likely to achieve the aims of the research (Easterby-Smith et al., 1991). As such, a research design may be regarded as a blueprint for getting from 'here' to 'there', where 'here' may be defined as an initial set of questions to be answered, and 'there' is a set of answers to these questions (Yin, 1994). The research design of this study is described in Section 3.2, in which the empirical and design-oriented cycles of research are discussed. The choice for a case study research methodology is described in Section 3.3.

3.2 Research Design

The science and study of Information Systems (IS) is the examination of phenomena associated with the organization, management, development, use and impact of IT. The science and study of IT itself is the domain of Computer Science. Similar to the fields of Medicine, Law, Engineering, Organization and Management, the field of IS is an applied discipline, rather than solely a 'pure' discipline (Benbasat & Zmud, 1999; Easterby-Smith, 1991; Davenport & Markus, 1999; Keen, 1991; Lee, 1999). Consequently, the field of IS has two objectives (Moody, 2000; Swanborn, 1987): (a) to increase knowledge and understanding of why and how phenomena transpire in reality, and (b) to improve practices by providing answers to specific questions related to action, performance, or other social and organizational needs. While the latter is practice-driven, the former is theory-driven. The contemporary problems regarding Information Governance, and the call for more research on 'the new organizing logic' of Information Governance are exemplary of the practice-driven and theory-driven nature of problems in the IS field.

An applied discipline is not exclusively interested in the development of knowledge for the sake of knowledge, but moreover, in the applicability of this knowledge to the resolution of (organizational) problems. From a research perspective, these competing objectives, however, have prompted the development of two different research strategies, i.e., the empirical approach and the design approach (Figure 3.1). The empirical approach - through induction, deduction, and testing - is geared at knowledge generation, whereas the design approach - through diagnosis, design, and implementation - is geared at problem-solving. These competing objectives have also caused considerable discussions, often coined the 'rigor versus relevance' debate, and the 'positivist versus interpretivist' debate, on the status of IS as an academic field (Applegate, 1999).

There is indeed a long-standing debate in the social sciences on what philosophical position a research design should be based (Cassell & Symon, 1994). The IS field has not been immune to this debate. For the past two decades, theorists and researchers of information systems have argued about the most appropriate philosophical position for designing research in the IS field (McLean, 1980; Klein et al., 1991). Fitzgerald & Howcroft (1998) and Myers (1999) provide an outline of the research dichotomies involved in this debate (See also Appendix A).

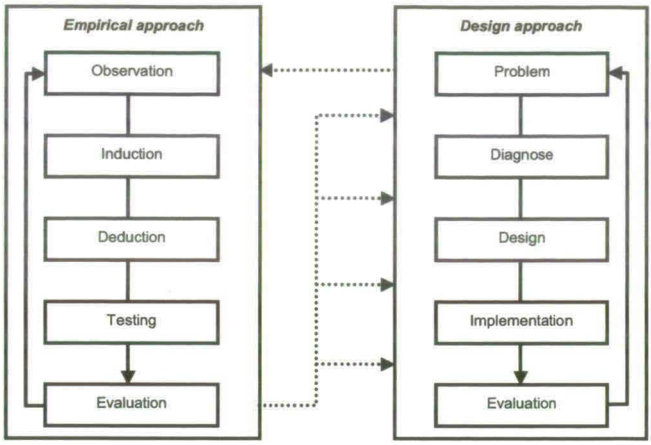

Figure 3.1. Empirical and design research strategies & interconnections (Based on Benbasat & Zmud, 1999; Davenport & Markus, 1999; Easterby-Smith et al., 1995; Swanborn, 1987; Moody, 2000;Van Aken, 1994; Van der Zwaan, 1990).

Several strategies have been proposed to resolve the debate on the philosophical orientations of research designs. Fitzgerald & Howcroft (1998), building forth on the work of Iivari (1992), Klein et al. (1991) and Lee (1991), distinguish four possible solutions. *Supremacism* seeks to establish one research paradigm that is universally applicable and best in all situations. *Isolationism* argues that research designs of different philosophical orientations cannot be combined, and should operate strictly according to a particular paradigm, hence ignoring other paradigms. *Integrationism* seeks to integrate alternative approaches into a single coherent mode of analysis. *Pluralism* allows for the application of different research approaches within the same research situation. The main difference compared to integrationism is the diversity of methods and theories applied in the scientific inquiry.

Framing the differences and the resolutions in the philosophical orientations of research design is important to illustrate that there are competing claims regarding what constitutes warrantable knowledge (Cassell & Symon, 1994). However, the question still remains how to organize the research activities, in ways that are most likely to achieve the aims of the research. While the strategies formulated by Fitzgerald & Howcroft (1998) seem valid at a meta-theoretical level, little information is provided on how to implement and operationalize these research design strategies. Fitzgerald & Howcroft (1998) do provide an implicit answer when they state that the essence of the problem is rather than choosing a research design appropriate to the research question, research designs are often based upon the dominant institutional environment, hence the choice becomes a dogmatic orthodoxy. Fitzgerald & Howcroft (1998) hint here towards a fifth strategy for resolving the philosophical debate on research design: *eclecticism*.

Klein et al. (1991) state that *eclecticists* share with pluralism the idea that a variety of different research approaches exist, and that it is possible to pick and choose from different methods to build a specific research approach that is most fruitful for a given situation or problem. From the perspective of eclecticism, different research methods are chosen based upon the purpose of research (Crompton & Jones, 1988). Research methods are not associated with phenomenology. It is how these research methods are used and data interpreted that defines the philosophical orientation on which they are based (Hartley, 1994). Moreover, Easterby-Smith et al. (1991) state that the appropriateness of a research approach derives from the nature of the phenomenon to be explored. Eclecticism provides at least some reference from which a suitable research design may be chosen, in order to organize the research activities, in ways that are most likely to achieve the aims of the research. From an eclecticists' perspective criteria that determine the suitability of a research design are, (i) the nature of the phenomenon to be explored and (ii) the purpose of research. Within the field of IS research, Benbasat et al. (1987) also conclude that the goals of the research and the nature of the research topic influence the selection of a research strategy.

Moreover, there is, no 'universal law' stating that empirical research need not be relevant, and that design research need not be rigorous. Researchers adhering to a 'positivist' paradigm identify and understand a problem from within their frame of reference, i.e., interpreting and socially reconstructing a problem situation (Smith, 1996). Likewise, researchers adhering to an 'interpretivist' paradigm also need to follow a set of principles for conducting research (Klein & Myers, 1999). For example, Benbasat et al. (1987) follow a positivistic approach, and argue for idiographic research, and the use qualitative data to gain an in-depth understanding of a complex phenomenon. Walsham (1995) on the other hand, follows an interpretivist approach, and argues for the use of theory to design and collect data.

Easterby-Smith et al. (1994) state that the debate on philosophical orientation focuses is on the meta-theoretical, and each of these positions has been elevated to artificial stereotypes. Myers (1999) suggests that ontological and epistemological research designs are indeed ideal types. In general, relevance and rigor are equally important to sound empirical research, independent of the philosophical orientation of the research design (Applegate, 1999). Both empirical research and design research, whether 'positivist' or 'interpretivist', involve the process of developing systematized knowledge gained from observations that are analyzed and synthesized, in order to gain insight, develop understanding, and propose solutions to a problematic situation or complex phenomena. Fitzgerald & Howcroft (1998) conclude that the debate on the philosophical orientations of research design is relatively vacuous, since each position has its strengths and weaknesses, and should be seen as complementary, instead of competing. Given the increasing dynamics and complexity of the organizational context in which IS research is conducted, the traditional differentiation between these approaches needs to be complemented by integration, and guided by the purpose of the research.

Benbasat & Zmud (1999), Davenport & Markus (1999), and Moody (2000) discuss the 'disconnect' that exists between research and practice in IS. They argue that IS researchers and IS managers form independent communities with little overlap and knowledge transfer between them. Galliers (1994) concludes that the research and practical agendas of in IS are indeed very different. In terms of Figure 3.1, the academic community is focused on knowledge generation following an empirical approach, while the practitioners' community is focused on solving problems through the design approach. Yet, in both approaches 'theory' is highly relevant, albeit at different levels of operationalization. In the empirical approach, theory is used to develop, test and advance understanding, whereas in the design approach 'local' theories are used to design, implement and resolve problems. Furthermore, the induction and diagnosis stages both lead to a refined understanding and specification of a problem. The deduction and design stages both involve the development of proposed solutions, whereas testing and implementation both involve putting the design to practice.

Benbasat & Zmud (1999), Davenport & Markus (1999), Fitzgerald & Howcroft (1998), and Moody (2000) discuss different strategies for resolving the debates and integrating the different approaches. From a research design perspective, these scholars indicate the need to focus on 'social needs', 'relevant problems' and 'organizational challenges' when selecting a research topic. The problem should not be solely 'theoretical' (see top dotted arrow in Figure 3.1). Davenport & Markus (1999) and Moody (2000) suggest that the field of IS should emulate the field of Medicine, an applied discipline where the *raison d'être* is an external need, i.e., to find ways of preventing, detecting and curing disease. According to Benbasat & Zmud (1999), IS researchers should also focus on the likely outcomes of the research, instead of a preoccupation with the inputs, i.e., specific methodology to be used, which should be determined by the objective of the research. Outputs include frameworks, reviews, practices, and tools for assisting the practicing community in each of the problem solving stages (Benbasat & Zmud, 1999). Concerning the inputs, Fitzgerald & Howcroft (1998) indicate that the appropriate design is one that provides answers to the research questions, thereby proposing 'eclecticism'. The criteria for a suitable research methodology are (a) the nature of the phenomenon to be investigated, (b) the purpose of research, and (c) the types of research questions posed (Benbasat et al., 1987; Bonomo, 1985; Crompton & Jones, 1988; Easterby-Smith et al., 1991; Galliers, 1991; Klein et al., 1991; Smith, 1990; Yin, 1994).

As indicated in Chapter 1, the main purpose of this research is to gain understanding of the complexities regarding Information Governance in contemporary IT-intensive business environments in order to advance theory. This purpose is formulated based upon a review of contemporary environments (Chapter 1) and previous studies (Chapter 2). As such the research problem and objectives are not solely defined by theory, but also by practice. Subsequently, the intended output of

this research is not only theory building and advancement, but also the provision of organizational design alternatives for differentiating and integrating strategic IT decision-making. In terms of Mintzberg (1978), *"those knobs that influence how organizations function"*. The design alternatives, however, will not be implemented in organizations. It follows that the research design utilized in this study is essentially empirical, and only partially design-oriented. However, by developing the conceptual framework in design terms, the applicability and usefulness of the results and conclusions for organizations are increased (Benbasat & Zmud, 1999).

Different research methodologies have been put forward in the literature on organization, management and IS research (Easterby-Smith et al., 1994; Swanborn, 1987; Van der Zwaan, 1992; Yin, 1994). Based on a literature study, Galliers (1991) develops a taxonomy that identifies the situations in which a research methodology is best suited in relation to (a) the general topic area of the proposed research, and (b) the process of theory development and extension in the specific topic area being discussed. In a similar fashion, Yin (1994) specifies three conditions that influence the selection of a particular research design: (a) the type of research question posed, (b) the extent of control an investigator has over actual behavioral events, and (c) the degree of focus on contemporary, as opposed to, historical events. In comparing Galliers (1991) with Yin (1994), two observations are noteworthy. Yin (1994) does not explicitly include action research and forecasting, two established research strategies within the social sciences. Likewise, Galliers (1991) does not explicitly include historical analysis as a research approach within the IS. Based on an integration of the different taxonomies and conditions provided by Galliers (1991) and Yin (1994), an overview of different research methodologies and criteria are presented in Table 3.1.

Table 3.1. Research criteria and methodologies (Based on Galliers, 1991; Yin, 1994).

CRITERIA STRATEGY	Research question	Control over behavior	Focus on contemporary events	Theory building	Theory extension	Theory Testing	Level of Analysis
EXPERIMENT	How, Why	Yes	Yes	No	Yes	Yes	Groups Individual
SURVEY	Who, What, Where, How many, How much	No	Yes	Possibly	Possibly	Yes	Society Organization
CASE STUDY RESEARCH	**How, Why**	**No**	**Yes**	**Yes**	**Yes**	Yes	Society Organization Individual
FORE CASTING	Who, What, Where, How many, How much	No	Yes (No)	Yes	No	No	Society Organization Individual
SIMULATION	How, Why	Yes	Yes	Yes	No	Possibly	Organization Individual
ARCHIVAL / REVIEWS	Who, What, Where, How many, How much	No	No (Yes)	Yes	Possibly	Possibly	Society Organization Individual
ACTION RESEARCH	How, Why	Yes	Yes	Yes	Possibly	Possibly	Group
HISTORY	How, Why	No	No	Yes	Possibly	Possibly	Society Organization Individual

Recalling the research objectives, the research questions, and acknowledging that the research has *no control* over behavior, and focuses on a *contemporary phenomenon* within organizations, with the research characterized as *exploratory* and *explanatory,* aimed at *theory-building* and *advancement*, it follows that *case study* is the appropriate research methodology. Furthermore, due to the limited cumulative IS research base, the potential terminological ambiguity surrounding Information Governance, and the sensitive nature of the data, case study research is deemed appropriate (Benbasat et al., 1987; Chan & Huff, 1992; Broadbent & Weill, 1993; Darke et al., 1998).

3.3 Case Study Research

Case study research involves a detailed empirical inquiry that investigates a contemporary phenomenon within its real-life context, with the purpose of providing an analysis, and an in-depth understanding of the context and processes involved in the phenomenon under study (Eisenhardt, 1989; Hartley, 1994).

The phenomenon is of interest precisely because it is in relation to, and interacts with its context (Yin, 1994). Feagin et al. (1990) state that the quintessential characteristic of case study research is that it strives towards an in-depth understanding of a social system of action of multiple stakeholders.

Case study research is now accepted as a valid research methodology within the IS field (Klein & Myers, 1999), and is the most widely used research approach in IS studies (Darke et al., 1998; Myers, 1999). Case study research is particularly well suited to IS research, given the complexity and dynamics of both business and IT environments (Benbasat et al., 1987). With regard to Information Governance, case study research is highly appropriate for understanding organizational and decision-making processes (Cyert & March, 1958; Easterby-Smith et al., 1991; Mintzberg, 1978; Smith, 1990).

Case study research can be used to achieve various aims: to provide descriptions, and to develop and test theory (Yin, 1994; Eisenhardt, 1989). Consistent with the research objectives of this empirical study, the case study research design is geared at developing and extending theory. In terms of Bacharach (1989), this involves identifying constructs, and relationships among constructs, within a set of boundary assumptions and constraints. Eisenhardt (1989) explains how case study research may be used to develop theory and build conceptual frameworks. The stages in the process of theory-building from case study research are described in Table 3.2.

3.3.1 Theory-Building

An important and distinct characteristic of theory-building case study research is the fact that hypothesis emerge from data, strengthened by theory, and are not a-priori specified, consequently leading to frequent iteration between induction, deduction and testing (Swanborn, 1987). Theory-building case study research does start of with an 'a-priori' conceptual framework in order to guide the investigation. As such, it differs from the grounded theory approach described by Glaser & Strauss (1967). Eisenhardt (1989) indicates that theory-building case study research permits the development of novel theory and frame breaking insights, by revealing emergent patterns and trends, which inform theory (Eisenhardt, 1989), and are thus 'driven to theory' (Yin, 1999). It is not infrequent that research in the field of IS, in trailing change and innovation, learns from practice, rather than providing the initial wisdom for understanding (Benbasat et al., 1987; Davenport & Markus, 2000). This certainly seems to be the case for Information Governance (see Chapter 1). In this study, a combination of Yin's (1994) and Eisenhardt's (1989) procedures for case study research are adopted, extended with suggestions provided by Benbasat et al. (1987), Easterby-Smith et al. (1991), Darke et al. (1998), Ragin (1999) and Smith (1990).

Table 3.2. Steps in theory-building case study research compared to general case study research (Based on Yin, 1994; Eisenhardt, 1989).

Theory-Building Case Study Research	General Case Study Research
Problem identification and problem definition	Problem identification and problem definition
Development of research questions	Specify research objectives and questions
Develop 'a-prior' conceptual framework	Develop conceptual framework and hypothesis
Case study design, data collection, (cross) case data analysis, framework shaping	Conduct case study and analyze case study findings
Comparison with literature and implications	Develop conclusions and recommendations

Any (scientific) investigation is guided by a research problem, and subsequent research objectives and questions. Eisenhardt (1989) points out that theory-building case study research can lead to 'data rich, information poor' situations, in which a lot of data might have been collected, but lacks the simplicity of overall perspective, and may result in narrow idiosyncratic theory. Therefore, specifying the research problem and objectives is critical to the quality of (theory-building) case study research. In Chapters 1 and 2, the research problem, research objectives and the research questions were presented.
Case study research, furthermore, requires a comprehensive literature study to be undertaken in order to understand the existing body of knowledge - and gaps -, and to position the research questions within the context of that body of knowledge (Darke et al., 1998). This may also add to face and construct validity, as constructs that have been used in prior research, may be used as part of the conceptual framework (Yin, 1994). The rationale for defining the 'a-priori' conceptual framework is the same as in theory testing research (Eisenhardt, 1989). The conceptual framework guides the investigation. In

Chapter 2, organization (contingency) theories were briefly introduced in order to discuss and criticize previous studies. These theories are discussed and synthesized in Chapter 4, in order to develop the conceptual framework and propositions.

However, and more importantly, in (theory-building) case study research, the conceptual framework is also used for analyzing and interpreting the evidence. Previously developed theory and the conceptual framework are used as a template with which to compare the empirical results of the case study. As Yin (1994) indicates, the appropriately developed theory is also the level at which the level of generalization of the case study results occurs. The extent to which generalization may be made from case study research therefore depends upon the adequacy of the underlying theory and the conceptual framework on which the cases are analyzed (Smith, 1990). The goal is to expand and generalize theories, and not to enumerate frequencies.

3.3.2 Analytical Generalization

Smith (1990) indicates that much of the criticism directed at case study research is based on this misconception of the basis from which justifiable extrapolations can be made. Yin (1994) distinguishes two types of inferences: (a) 'level one' statistical generalization, and (b) 'level two' analytical generalization (Figure 3.2). Analytical generalization or logical inference is the process by which the researcher draws conclusions about the essential linkage between two or more characteristics in terms of some systematic explanatory scheme, i.e., a set of theoretical propositions (Smith, 1990). The process of analytical generalization from case studies is therefore not statistical, and external validity should not be the overriding concern or point of critique. If it is, then it is not the case study research method that is flawed, but the research objectives and research questions underlying the empirical investigation.

Yin (1994) compares this process to laboratory experiments, in which an experiment is conducted in order to test a theory, and a replication - not sampling - logic is used. Furthermore, the empirical results may be considered yet even more persuasive if the case study results support the theory, but do not support an alternative rival theory. Yin (1994) suggests that such an approach emphasizes the definition and testing of rival propositions. The more the rival propositions are investigated and rejected, the greater the support for the original propositions (Yin, 1994). The formulation of a rival proposition is akin to Popper's (1968) concept of falsification, i.e., we cannot prove that a theory is true, but we can show that a rival proposition is false. Popper (1968) argues that scientific research should attempt to disprove rather than verify hypotheses. Analytical generalizations, though not verifiable, are falsifiable. To paraphrase Popper (1968): "The game of science is, in principle, without end. He who decides one day that scientific statements do not call for any further test, and that they can be regarded as finally verified, retires from the game".

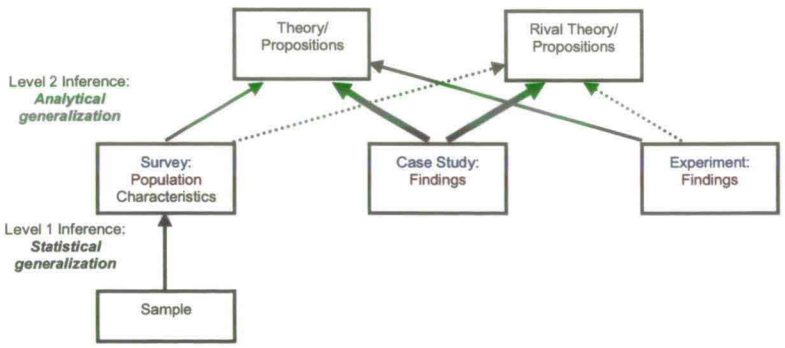

Figure 3.2. Level 1 and level 2 Inferences: Case study as analytical generalization (Adapted from Yin, 1994; Smith, 1990).

In this study, the objective is to advance theory, not to test theory based on a sample of the total population. Following a literature study of organization (contingency) theory (see Chapter 4), a conceptual framework is developed and used as a reference model to conduct the investigation, and analyze the case study findings. The type of generalization is therefore analytical, aiming at expanding and developing a theory on the (new) organizing logic of Information Governance (see Chapter 1). Rival propositions are included, in order to assess the theoretical validity of the framework and underlying propositions. The main thesis of this study is:

> *In the federal model for Information Governance, the division of decision-making for IT needs to be complemented by adequate coordination, in order to realize performance effectiveness.*

The rival thesis is formulated as:

> *In the federal model for Information Governance, the division of decision-making for IT is automatically coordinated, leading to the realization of performance effectiveness.*

3.3.3 Unit of Analysis

The literature study and research questions facilitate the specification of the unit(s) of analysis and the selection of cases (Benbasat et al., 1987). Yin (1994) distinguishes between 4 types of case study research designs for specifying the unit(s) of analysis: (a) single case study, (b) single embedded case study, (c) multiple case studies, and (d) multiple embedded case study (Figure 3.3). Given the objective of this study to explore and explain the complexity of Information Governance in contemporary IT-intensive business environments, a *multiple embedded case study design* is chosen.

According to Eisenhardt (1989), comparative analysis of multiple case studies provides explanatory power to the conceptual framework. Similarly, Benbasat et al. (1987) indicate that multiple case studies allow for cross case analysis, the extension of theory, and yield more general research results. Multiple case studies improves the internal validity of the case study research (Yin, 1994), and by searching for patterns of differences and similarities, within and across cases, relationships may be identified and propositions tested (Eisenhardt, 1989; Ragin, 1999). This technique of pattern analysis is discussed in Chapter 5.

Furthermore, given the nature of Information Governance, i.e., strategic IT decision-making *across corporate and business levels within the organization*, the case study research design can be classified as *embedded.* Information is gathered from both the corporate level and the business unit level in the organization. However, given the strategic impact of business unit factors on the federal design of Information Governance (Brown, 1997; Brown & Magill, 1998), and the dilution of IT impacts on organizational performance at the corporate level (Weill & Broadbent, 1998), the primary unit-of-analysis is the business division unit.

	Single case	*Multiple cases*
Single unit of analysis	Type 1	Type 3
Multiple embedded units of analysis	Type 2	**Type 4**

Figure 3.3. Information Governance study: multiple embedded case study design

3.3.4 Case Selection

The research objective also guides the selection of case sites (Benbasat et al., 1987), in which a replication - not a sampling - logic applies (Yin, 1994; Eisenhardt, 1989). Each case is selected so that (a) similar results are predicted, or (b) contrasting results are produced for predictable reasons. Chan & Huff (1992) state that when studying 'strategic phenomena', case sites should be selected in concentrated or single industries, and should be studied within, and not across industries, thereby controlling for industry effects. Benbasat et al. (1987) indicate that research on 'organizational phenomena' requires site selection based on firm characteristics, including, size, organizational structure, public or private ownership and geographic coverage. Here a replication logic based on

theoretical sampling is used and improves the external validity of the research (Yin, 1989), *within* the boundaries of assumptions and constraints (Bacharach, 1989). Benbasat et al. (1987), in discussing the case research strategy for IS, conclude:

> *"From the studies conducted to date there is evidence that some companies use information technology more effectively as a strategic weapon than others. A systematic study of several companies within one industry could provide important insights into why some companies use information technology more successfully than others".*

As indicated in Chapter 1, this study is conducted in a single industry - Financial Services -, and in a single country - The Netherlands -, thereby controlling for industry-related, regulatory, geographic and national/cultural effects. The choice for the Financial Services industry is based on the information-intensive nature of products, services and processes - in which IT plays a strategic role -, and the complex and dynamic nature of the Financial Services' environment (Karimi et al., 2001; Toppen, 1999; Van der Poel, 1996; Venkatraman & Zaheer, 1990; Weill & Broadbent, 1998).

The selected organizations are large in size - employing over 2000 staff -, and have multiple business divisions operating in related markets, each with profit responsibilities. More importantly, *the organizations are characterized by a federal model for Information Governance.* The organizations were thus purposefully sampled because of their federal model for Information Governance. Consequently, in terms of the factors that influence Information Governance (see Section 2.3), this study is primarily concerned with the competitive strategy and design of Information Governance in large information-intensive organizations, operating in similar - dynamic and financial - markets. Research indicates that organizations populating the same industry, adopt different competitive strategies, yet share similar organizational processes and structures (Palmer & Markus, 2000; Venkatraman, 1989). Thus, the strategic context is more likely to account for any observed variation in the hybrid design of Information Governance (Henderson & Lentz, 1994; Weill & Broadbent, 1998).

Table 3.3. Control variables for this study (in italics).

Contingency Factors	Centralized Information Governance	Federal Information Governance	Decentralized Information Governance
Corporate strategy	Related Markets		Unrelated Markets
Business strategy	Low-cost	Differentiation	Differentiation
Business governance	Centralized	Decentralized	Decentralized
Organization size	Small		Large
Information-intensity	Low	High	High
Environment stability	High	Low	Low

Miles & Huberman (1994) indicate that the unit of analysis also identifies the sources for data collection. One of the strengths of case study research is the reliance of data collection on different sources of evidence (Easterby-Smith et al., 1991; Eisenhardt, 1989). In this study, a combination of semi-structured interviews with different stakeholders, and organization archival evidence of - public and private - documents relating to IT decision-making processes and structures are used as the main data sources.

As suggested by Yin (1994), all the data was stored in an - electronic and paper - database. The use of multiple sources of evidence is known as triangulation, a term borrowed from navigation where a minimum of three reference points is taken to verify an object's location. Easterby-Smith et al. (1991) distinguish between four categories of triangulation: (a) theoretical triangulation, using reference disciplines; (b) data triangulation, using multiple sources of information; (c) investigator triangulation, using different researchers in the same data collection process; and (d) methodological triangulation, the use of qualitative and quantitative data. In this study, theoretical, data, and methodological triangulation are utilized. In Chapter 5, the specifics of the data collection and data analysis procedures are discussed.

3.4 Conclusion

In this chapter, the research design was described. The empirical and design approaches were discussed. Based on the research objectives of this study, the empirical approach was chosen, and a case study design selected. The specific attributes of case study design were described in the foregoing section, addressing the importance of the conceptual framework and analytical generalization. A multiple embedded case study design was chosen.

The remainder of this dissertation is structured as follows (Table 3.4). Based on an extensive review of the organization and management literature, a conceptual framework and propositions are developed (Chapter 4). In Chapter 5, the operationalization of the constructs is presented, and the methods for data collection and data analysis are described. The case studies in Financial Services are described and analyzed in Chapter 6. The dissertation concludes with a discussion of the main lessons learned, the limitations and implications of the research findings, and directions for future research.

Table 3.4. Outline of the following chapters.

Chapter	Title	Topic(s)
4	Toward a Conceptual Framework	Literature study for developing the conceptual framework and propositions
5	Research Methods	Operationalization of the constructs; Organization and instrumentation of the case study data collection and analysis
6	Information Governance in Financial Services	Description and analysis of six case studies conducted in large financial service companies; Validation of the conceptual framework
7	Conclusions	Answers to research question; Limitations of the research; Implications of the research; Directions for future research

Chapter 4: Toward A Conceptual Framework

What is past is prologue – Shakespeare

4.1 Introduction

In the previous chapter (Chapter 3), the research design of this study was presented. It was stated that empirical research requires a thorough study of literature and extant conceptual frameworks in order to utilize this 'referent' knowledge to the field of IS. This is particularly relevant in research that aims to expand and advance theory development on a complex and contemporary phenomenon. Consequently, this chapter addresses the literature study and conceptual framework underlying this investigation. The literature study and framework are rooted in - contingency - organization design theories, which were briefly introduced in Chapter 2 to discuss previous studies. The conceptual framework thus builds forth on previous studies, and extends the classical framing[25] of Information Governance, thereby enabling a cumulative research tradition on Information Governance, as recommended by Keen (1991) and Benbasat & Zmud (1999).

The remainder of this chapter is organized as follows. Based on the general systems approach of organizations (see Chapter 2), the design logic of organizing is presented in Section 4.2. Specifically, classical and contingency theories of organization are discussed, and a congruency model of organizations is presented. This model serves as an organizing template for the remainder of this chapter. In Section 4.3, the strategic context of Information Governance is described. The elements of the task environment are outlined, and the conflicting strategic contingencies of contemporary organizations are discussed. Different competitive and competing strategies are presented. Subsequently, the differentiation and integration of decision-making for IT is dealt with in Section 4.4. The need for differentiation and consequently integration are discussed, and a multilevel portfolio of integration mechanisms is presented. Furthermore, the main propositions underlying this study are presented. In Section 4.5, the strategic outcome of Information Governance is described. Different models of organizational effectiveness and indicators of IT Business Value are presented. Based on the Information Governance framework, an IT Business Value Chain is described. This chapter concludes with the presentation of the conceptual framework, and a summary of the main propositions underlying this study (Section 4.6)

4.2 Design Logic of Organizing

The design logic of organizing is rooted in two fundamental - antagonistic - design principles. From the classical writings of Smith (1776), Fayol (1930), Gulick & Urwick (1937), Moony & Riley (1939), March & Simon (1958), and Cyert & March (1963), to the neo-classical work of Lawrence & Lorsch (1967), Thompson (1967), Galbraith (1973), Tushman & Nadler (1977), (Mintzberg, 1979), Daft & Lengel (1984; 1986), to the contemporary writings of Galbraith (1994), Malone & Crowston (1994), Lawler (1996), Hitt et al. (1998), Nadler & Tushman (1998), and Venkatraman (2000), the design logic of organizing revolves around the processes of (a) *division* of labor into various tasks to be performed, and (b) *coordination* of these tasks to accomplish the activity, and achieve the organization's goals.

[25] Framing provides focus, much like the designers of Japanese gardens who use portals to direct one's view. The portals focus attention on the landscape in which ponds, greenery, structures, and the like are positioned in an aesthetically pleasing manner. Framing offers a designer's landscape, in which useful cues are more apt to be present.

Thompson (1967) describes the basic logic of organizing in the following manner:

> *"By delimiting tasks, responsibilities and other matters, organizations provide their participating members with boundaries within which efficiency may be achieved. But if structure affords numerous spheres of bounded rationality, it must also facilitate the coordinated action of those interdependent elements".*

Lawrence & Lorsch (1967) state that the division of labor and the need for unified effort, lead to a state of differentiation and integration within any organization. Recently, Nadler & Tushman (1998) and Venkatraman (2000) conclude that the dilemma of organization remains how to design and manage both differentiation and integration. The design problem is to create mechanisms that permit coordinated action across different interdependent units (Galbraith, 1973). This organizing logic is equally applicable to the design of governance systems (March & Simon, 1958; Mintzberg, 1979; Nielen, 1993; Ribbers, 1980; Simon, 1961).

4.2.1 Classical & Contingency Theories of Organization

While the classical organization scholars did acknowledge the dual need for division and coordination[26], they failed to recognize the bounded[27], systemic and contingent nature of organizing (Lawrence & Lorsch, 1967). March & Simon (1958) indicate that in classical organization theory coordination needs are eliminated, since the whole set of activities to be performed is specified in advance, and once these are allocated to organization units and individuals, the coordination problem solved through the scalar chain of authority - the hierarchy -, and standard operating procedures (Fayol, 1930). However, as March & Simon (1958) and Galbraith (1973) argue, interdependencies in an uncertain environment necessitate greater amounts of information processing and exchange, for which the hierarchy and standard operating procedures are insufficient mechanisms, due to time and standardization constraints. Classical organization theory failed to state the limits of the applicability of their 'principles' (Fayol, 1930) to particular situations or types of organizations (Scott, 1998; Simon, 1961). Consequently, the rational, hierarchical-coordinated 'one best way' of organizing was replaced by a contingency design logic, in which there is no one best way to organize, and any way of organizing is not equally effective (Galbraith, 1973).

The contingency design logic is rooted in a general system perspective, and views the organization as a system of interrelated behaviors of people who are performing a task that has been differentiated into several distinct subsystems, each subsystem performing of portion of the task, and the efforts of each being integrated to achieve effective performance of the system (Lawrence & Lorsch, 1967). In their seminal work, Lawrence & Lorsch (1967; 1969), building forth on the studies by, e.g., Burns & Stalker (1961), Woodward (1958), Leavitt (1958), developed a contingency theory of organization based on the notions of differentiation and integration.

Differentiation is defined as (Lawrence & Lorsch, 1967; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970):

> *"The state of segmentation of the organizational system into subsystems, each of which tends to develop particular attributes in relation to the requirements posed by the relevant environment. This includes both the formal division, as well as, behavioral attributes of the members of organizational subsystems".*

With regard to integration, different definitions have been put forward by Lawrence & Lorsch (1967; 1969) and Lorsch & Lawrence (1970). Integration is defined as:

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[26] See, e.g., Fayol's (1930) discussion of *Esprit de Corps*, and the need to 'harmonize'.

[27] March & Simon (1958) refer to the bounded rationality of decision-making, i.e., organizations can not overlook all possible alternatives, and do not have complete information and unlimited information processing capabilities for solving problems. Furthermore, there are costs associated with gathering, organizing, and retrieving information. The decision-making system is thus 'bounded', and is concerned with the discovery and selection of satisfactory alternatives - alternatives that satisfy aspiration levels -, in stead of optimal alternatives.

"The process of achieving unity of effort among various subsystems in the accomplishment of the organizational task" (Lawrence & Lorsch, 1967).

"The quality of the state of collaboration that exists among departments that are required to achieve unity of effort by the demands of the environment" (Lawrence & Lorsch, 1969)

"The degree of collaboration and mutual understanding actually achieved among various organizational units" (Lorsch & Lawrence, 1970).

Collaboration describes the participative behavior of different actors to clarify differences and solve problems, and refers to finding an integrative solution by combining different insights (Lorsch & Lawrence, 1970; Robbins, 1994). Schrage (1990) defines collaboration as a purposeful relationship among people, because of a need to solve a problem, or to discover something within a set of constraints, e.g., expertise, time and money. Lorsch & Lawrence (1970) indicate that collaboration is essential to decision-making, especially when decisions are non-routine and are made under conditions of uncertainty and ambiguity (see Section 4.5.1).

The contingency theory attempts to understand the interrelationships within and among organizational subsystems, as well as between the organizational system as an entity and its environment (Mintzberg, 1979). It emphasizes the multivariate nature of organizations and aims to understand how they operate under varying conditions. Organizations differ in the design situations they face, and are characterized by (a) differences in the set of functional demands imposed on the organization, and (b) the resolution of design conflicts generated by multiple demands (Gresov, 1989). Multiple contingency theory is based on the premise that organizations evolve in response to a diverse set of requirements, and designing organizations to several contingencies involves tradeoffs, and the resolution of conflicting demands through design (Gresov & Drazin, 1997).

Central to the contingency theory is the notion of 'fit', i.e., the proposition that the design of an organization must be internally consistent and fit its context, if it is to be effective. According to the contingency theory, effective organizing requires (a) a close fit between the situational factors and the design parameters, and (b) an internal consistency among the design parameters (Mintzberg, 1979). Drazin & Van de Ven (1985) describe three forms of measuring fit: (a) selection, (b) interaction and (c) systems. The selection approach describes fit as the congruency between the organizational context and organizational design, without examining the performance implications of the context-design relationship. The interaction approach describes fit as an interaction effect between the context and structure of an organization on performance. The selection and interaction approach focus on single contextual factors and single structural characteristics. The systems approach addresses simultaneously multiple contextual, structural and performance characteristics in a holistic manner. The systems approach is also referred to as the multiple contingency approach (Gresov, 1989). The multiple contingency approach states that organizational designs are attempts to respond to multiple, conflicting contingency factors. The purpose of the multiple contingency theory is to address contingency factors in a holistic '*gestalt*' fashion (Gresov, 1989; Miller, 1978).

4.2.2 Critique of Contingency Theory: A Rebuttal of the Critique

The contingency theory has been criticized for its: (a) lack of clarity, (b) deterministic nature, (c) rational assumptions, and (d) focus on economic performance - or the lack of any performance assessment whatsoever - (Child, 1972; Drazin & Van de Ven, 1985; Morgan, 1986; Schoonhoven, 1981; Scott, 1998; Weill & Olson, 1989).

The concept of fit has been criticized for its static conceptualization (Drazin & Van de Ven, 1985; Morgan, 1986) Lawrence & Lorsch (1967), however, never made this assertion In fact, according to Lawrence & Lorsch (1967; 1969) as the organization's sub-environments continuously change, management should rethink and redesign organizational differentiation and integration mechanisms. Lawrence & Lorsch (1969) describe differentiation errors due to changing environmental and/or organizational circumstances, and the need for managers to actively diagnose the organization, its strategy, and its environment. Thus, Lawrence & Lorsch (1967) never implied that fit is static.

Furthermore, Nadler & Tushman (1998) indicate that while over the long-term fit may be desirable, frequently strategic shifts require the dismantling of fit in the short term. They conclude that fit is not a

steady state, but a continuous change process the organization undergoes. Gresov (1989) states that even if an organization was designed at one point so that the context of all its constituent units were ideal, change in the environment would erode fit. According to Gresov & Drazin (1997), it is not unrealistic to assume that managers pursue a strategy in design that attempts to 'minimize misfits'. Alternatively, strategic flexibility, rather than strategic fit, may be more important to organizational performance in dynamic and turbulent environments (Knoll & Jarvenpaa, 1994).

Schoonhoven (1981) argues that contingency theory is not a theory at all. According to Schoonhoven (1981) the contingency theory lacks hypotheses and empirical support, and is more of an orienting strategy or meta-theory. As a meta-theory, the contingency theory has indeed been applied in a number of areas, such as leadership (Fiedler, 1967), human resource management (Delery & Doty, 1996), research and development (Khan & McDonough, 1997) and strategic decision-making (Fredrickson, 1984). However, Lawrence & Lorsch (1967) do present and discuss seven specific hypotheses related to differentiation and integration, which they subsequently test.

Furthermore, subsequent studies by e.g., Ellinger et al. (1999), Griffin & Hauser (1996), Gupta et al. (1986), Hitt et al. (1993, 1998), John & Rue (1991), Kahn (1996), Kahn & McDonough (1997), Kahn & Mentzer (1998), Lorsch & Lawrence (1970), Nadler & Tushman (1998), Olson et al. (1995), Powell (1992), and Song et al. (1993) also indicate that effective organizations in complex and dynamic environments are characterized by a high levels of differentiation and integration, thereby confirming Lawrence & Lorsch's (1967; 1969) earlier findings, and their main thesis that differentiation requires appropriate integration for achieving organizational effectiveness.

It is noteworthy to indicate that these studies, following Lawrence & Lorsch (1967; 1969), have been primarily concentrated on the integration between the sales/marketing function with other business functions, including, Research & Development, Manufacturing/Production, and Logistics. The evidence that integration needs to match differentiation in order to achieve organizational effectiveness is strong, consistent, common across a variety of methodologies, and seemingly applicable in both service and manufacturing, and in both consumer and industrial markets (Ellinger et al., 1999; Griffin & Hauser, 1996). Thus, it seems that Schoonhoven's (1981) conclusion - although outdated - does not reflect either the original work conducted by Lawrence & Lorsch (1967; 1969), or more recent studies on differentiation and integration.

Contingency theory has also been criticized for its deterministic assumption regarding the relationship between environment and organization, i.e., environmental characteristics determine the organizational structure, and there is no managerial discretion. However, Lawrence & Lorsch (1967) indicate that strategy reveals an organization's perception and interpretation of the environment, and reflects the value premises of management concerning the 'dominant competitive issue'. Moreover, in discussing the results of their study, Lawrence & Lorsch (1969) conclude:

> *"...these dynamic market conditions mean that the dominant competitive issue for firms in these industries is the capacity to innovate in both processes and products".*
>
> *"...the difference in the major competitive issue* [...] *directly affects both the nature of integration and the degree of differentiation required...".*

Lorsch & Lawrence (1970) state that the specific strategy of an organization determines two dimensions of the environmental requirements with which the organization must deal: (a) the diversity by virtue of the range of market, technological and economic conditions, and (b) the interdependence among the various organizational subsystems dealing with the range of sub-environments. Lorsch & Lawrence (1970) conclude that the strategic choices made by an organization determine the characteristics of the environment in which the organization operates over a period of time, and affects the diversity and interdependence requirements posed on the internal organization. Furthermore, Lawrence & Lorsch (1967) state:

> *"*[...] *One useful way to conceive of the environment of an organization was to look at it from the organization outward. This approach is based on the assumption that an organization is an active system which tends to reach out and order its otherwise overly complex surroundings so as to cope with them effectively".*

Thus, the critique that contingency theory views the organization as a passive and reactive system, does not apply to Lawrence & Lorsch (1967).

Regarding the deterministic relationships between environment and organizational structures, Gresov & Drazin (1997) indicate, any particular structure can have different functions, and any function may be fulfilled by alternative structures. Functional requirements do not determine a particular structure, but rather permit a range of structures that will meet the functional demands. From an information processing perspective, uncertainty requires greater information processing capabilities (Galbraith, 1973), but does not determine the specific structures (Gresov & Drazin, 1997). Tushman & Nadler (1978) conclude that information processing demands can be met by a feasible set of alternatives from which the organization can choose. Organizations thus have design latitude and options, i.e., the principle of equifinality (Galbraith, 1973; Gresov & Drazin, 1997; Mintzberg, 1979; Lawrence & Lorsch, 1967; Tushman & Nadler, 1978).

The contingency theory is also criticized for its rational interpretation of organizations, i.e., organizational units share the same goals, 'functional unity' exists, and there is an absence of conflict and/or conflicting perspectives (Scott, 1998; Morgan, 1986). Lawrence & Lorsch (1967; 1969) explicitly indicate that organizational sub-units develop different goal orientations, and that conflict is endemic to any type of organization. The resolution of conflict is thus central to achieving integration in the organization. Lawrence & Lorsch (1967) specifically discuss the development of collaborative relationships and mutual understanding between differentiated organizational units. Thus, Lawrence & Lorsch (1967; 1969) do not assume that organizations are rational systems in which functional unity exists.

Another point of critique voiced at the contingency theory is its lack of performance assessment, or the sole focus on economic performance (Drazin & Van de Ven, 1985; Weill & Olson, 1989). According to the critics, contingency theory and contingency theory based research assumes that a fit between variables leads to improved performance, but does not assess performance effectiveness or improvement. Lawrence & Lorsch (1967; 1969) and Lorsch & Lawrence (1970) did however assess performance, including revenue and sales growth, and product innovation. Different studies, including, e.g., Ellinger et al. (1999), Griffin & Hauser (1996), Gupta et al. (1986), Hitt et al. (1993, 1998), John & Rue (1991), Kahn (1996), Kahn & McDonough (1997), Kahn & Mentzer (1998), Nadler & Tushman (1998), Olson et al. (1995), Powell (1992), and Song et al. (1993), have also employed performance measures. Thus, the critique that contingency theory and contingency research do not measure performance seems unfounded.

With regard to the assessment of economic performance, Lawrence & Lorsch (1967) argue that because organizations operate in a similar market environment, a profitable and growing operation can be a good indicator of the organization's effective coping with the environment. Based on empirical evidence, Dess & Robinson (1984), Venkatraman & Ramanujam (1987) draw similar conclusions. Thus, economic performance can be used as a - *proxy* - measure to compare the performance effectiveness of organizations operating in similar industries and market environments. Lawrence & Lorsch (1967) also conclude that economic performance is but one dimension of organizational performance.

Despite the critique, Scott (1998) concludes that the contingency theory remains the dominant approach in organization design, as well as the most widely utilized theoretical approach for the study of organizations.

4.2.3 Congruency Model of Organizations

Based on the cybernetic model of organizations, and subsequently the contingency theory, Nadler & Tushman (1998) and Galbraith & Lawler (1993) develop a congruency model of organization (Figure 4.1). The congruency model is based on a systems perspective of organizations. The input describes the environment, the organizational heritage and strategy, whereas the output describes performance at organizational, sub-unit and individual levels. Performance measures include goal attainment and adaptability at the organizational and sub-unit level, and satisfaction at the individual level (Nadler & Tushman, 1998). The process dimension includes both the governance and operational system as described by De Leeuw (1990) and Scott (1998). Consistent with the cybernetic model of organization, there are feedback loops running from outcome to processes and context.

The congruency model of organizations is used as a basic template to structure the remainder of this chapter. Applying the congruency model to the design of governance, Section 4.4 discusses the context, i.e., the organizational environment, the task environment, and competitive strategies. Section 4.5 describes the design of Information Governance, thereby focusing on the differentiation and integration of strategic decision making for IT. The Information Governance outcome dimension - i.e., business value appropriation from IT - is discussed in Section 4.6 This chapter concludes with the presentation of the final conceptual framework and underlying propositions (Section 4.7).

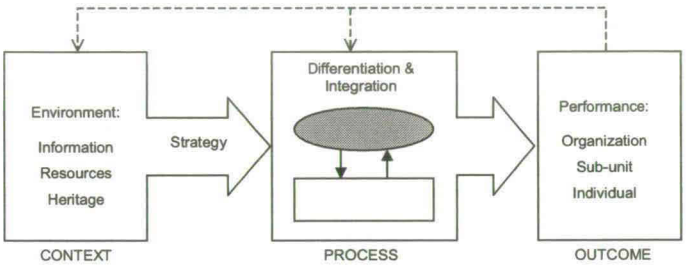

Figure 4.1. Congruency model of organizations
(Adapted from Galbraith & Lawler, 1993; Nadler & Tushman, 1998).

4.3 Strategic Context

Environment is an inclusive term and incorporates political, economic, technological and institutional aspects of the organizational context. The organizational context is defined as all elements that exist outside the boundary of the organization[28], that have the potential to affect all or part of the organization (Daft, 1998). The *organization domain* is the chosen environmental field of action, and consists of the range of products and services the organization provides, and the types of clients or consumers it serves (Daft, 1998). It defines those external sectors and stakeholders with which the organization will interact to accomplish its goals. Van de Ven & Ferry (1980) state that organizational domain refers to the specific goals of an organization in terms of the functions it performs, the products and services it renders, and the target populations and markets it serves. An organization goal is a desired state of affairs that the organization attempts to reach (Etzioni, 1964), and describes the aspiration levels of stakeholders (March & Simon, 1958). An organization's goals are not necessarily explicit, consistent or stable (Cyert & March, 1963; De Leeuw, 1990; March & Simon, 1958).

The *task environment* emphasizes those features of the environment relevant to the supply of inputs and the disposition of outputs (Daft, 1998). This concept is broadly defined as all aspects of the environment potentially relevant to goal setting and goal attainment (Scott, 1998). However, it is typically narrowed in use to refer to the nature and sources of inputs, markets for outputs, and competitors in the organization domain. The task environment describes the elements of the organization domains with which the organization interacts directly, and that have a direct impact on the organization's ability to achieve its goals (Daft, 1998).

The explicit and implicit, and intended and emergent manner in which the organization attempts to achieve its goals is referred to as *strategy* (Mintzberg, 1978). Strategy is the determination of the basic long term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals (Chandler, 1962). Mintzberg (1978) and Quinn (1980) argue that strategy is as much implicitly formed as it is explicitly formulated, and describes a pattern or plan that integrates an organization's major goals, policies and action sequences into a cohesive whole (Quinn, 1980).

In reviewing the literature on strategy, Chaffee (1985) concludes that a basic premise in thinking about strategy conveys the inseparability of organization and environment. Miles & Snow (1978) define

[28] An organization can exist at different levels, i.e., groups, units, intra-organizational, inter-organizational, communities and industries. The interpretation of a boundary is thus dependent upon the level of analysis.

organizational strategy as an ongoing process of evaluating purpose, as well as questioning, verifying, and redefining the manner of interaction with the competitive environment. Daft (1998) posits that strategy is a critical intervening contingency of organization design, and is influenced by the characteristics of the task environment. Khandwalla (1976) refers to strategy as a set of guidelines or policy heuristics developed as a response to the contingencies faced by the organization. Strategy is thus an intermediate factor between the task environment, and the goals and design of the organization (Galbraith & Lawler, 1993; Mintzberg, 1979; Nadler & Tushman, 1998).

Sanchez & Heene (1997) indicate that the organization's dominant rationale for achieving its goals is described by its 'strategic logic'. This strategic logic can reside both in the organizations strategic plans, as well as the values and practices embedded in the organization's routines. Weill & Broadbent (1998) describe an organization's *strategic context*, which refers to the desired position of the organization in the environment. The strategic context describes the strategic intent and business goals, and is influenced by the environment, and captures the notion that strategies are explicit and implicit, intended and emergent. A strategic contingency perspective suggests that managerial values and belief systems are the lenses that focus organizational options (Child, 1972; Donaldson & Lorsch, 1983), but within limits. Managers cannot exercise unlimited discretion, due to organizational, environmental and cognitive boundaries (March & Simon, 1958; Galbraith, 1973).

4.3.1 Task Environment, Uncertainty & Equivocality

As organizations interact with the task environments, they adopt different goals and strategies for dealing with their task environments (Lawrence & Lorsch, 1967). Weill & Broadbent (1998) indicate that strategies are derived and emerge from the organization's complex set of business, technological, organizational and competitive environments. In general, task environments differ on the following dimensions and their intermediate impact on organizations (Buenger et al., 1996; Cyert & March, 1963; Daft, 1998; Khandwalla, 1976; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970; March & Simon, 1958; Miller, 1988; Mintzberg, 1979; Scott, 1998):

- *Complexity* refers to the number of different elements in the organizational domain that must be dealt with simultaneously by the organization. The complexity of the environment ranges from simple to complex, and constrains comprehensibility on the part of organizational members. Complexity requires the organization to address multiple goals in the (sub-) task environments.
- *Diversity* is often considered a subset of complexity, and refers to the range or heterogeneity of markets the organization operates in, and ranges from integrated to diversified. Diversity is related to the strategic breadth of the organization.
- *Stability* refers to the changes in the different domains of the organizations, and ranges from stable to dynamic. Stability describes the predictability of change in, e.g., customer demands, competitor moves, technological developments and industry innovation. Dynamic environments require organizations to change and innovate their processes, products and services.
- *Hostility* is often regarded as a subset of stability, and refers to the competitiveness of the environment, the number of dimensions of competition, and the availability of resources. It is characterized by simultaneous price, product, technological, and distribution competition, shortages of resources, and unfavorable demographic and regulatory developments. In hostile environments, organizations require speed in order to respond in a timely manner to different environmental demands. Scarcity of resources, however, requires organizations to rationalize and use resources efficiently, and increase productivity of available resources. Hostility reduces organization slack, and organizations establish intra- and inter-organizational linkages to share (information) resources and assets. Hostility demands synergy on the part of the organization. Synergy entails the ability to (a) develop, share, and effectively apply managerial knowledge and techniques across organizational units - management synergy -, and (b) create linkages in terms of work-flows or cross-pollination of business and technical skills.
- *Volatility* is often regarded as a subset of stability - or confused with instability -, and refers to the unpredictability in the patterns of change in the organizational domain. Variable change patterns describe a turbulent environment, and require flexibility on the part of the organization, i.e., the ability to respond to variable patters of unexpected change.

The confluence of complex and dynamic environments, through the intermediate variables of (low) predictability, (low) comprehensibility, (high) diversity and (high) flexibility, increases the degree of uncertainty organizations can experience (Miller, 1988; Mintzberg, 1978; Daft, 1998). Environments

are by themselves not uncertain; it is the experience and perception by the organization that renders them uncertain (Khandwalla, 1976; Lawrence & Lorsch, 1969). The difference between information possessed and information required is referred to as *uncertainty* (Galbraith, 1978; Tushman & Nadler, 1978). Lawrence & Lorsch (1969) describe three elements comprising uncertainty: (a) the clarity of information, (b) the certainty of cause and effect relationships, and (c) the time span of definitive feedback. Definitive feedback closes the loop between the information possessed and the information required by the organization in order to perform effectively (Lawrence & Lorsch, 1967; Scott, 1998).

Organizations, furthermore, do not only face uncertainty, but they also face *equivocality* (Weick, 1979), i.e., lack of clarity of information and knowledge (Lawrence & Lorsch, 1969). Daft & Lengel (1986) describe equivocality as ambiguity, in which confusion, conflict, and lack of shared understanding exists. While theories of choice under uncertainty emphasize the complications of guessing future consequences, theories of choice under ambiguity emphasize complications of guessing future preferences (March, 1988). Whereas uncertainty is a measure of the organization's ignorance of a value for a variable, equivocality is a measure of the organization's ignorance of whether a variable exists (Daft & Lengel, 1986). Organizations may lack information on the acceptance of a new product, but they may be unaware of new and changing customer needs.

While uncertainty is caused by the lack of information, equivocality is caused by a lack of knowledge. Under these conditions, decision-making processes can be regarded as learning processes. March (1988) concludes that decision-makers do not begin by knowing all they need to know. In stead, decision-makers acquire information and apply knowledge as they proceed. By trial and error they find out what is feasible, and adapt their aspirations and expectations (Cyert & March, 1963; March, 1988). Uncertainty and equivocality thus require improved capabilities for processing information (Cyert & March, 1963; Daft & Lengel, 1984, 1986; Galbraith, 1973; March & Simon, 1958; Lawrence & Lorsch, 1967; Tushman & Nadler, 1978).

The description of the generic dimensions of task environments, indicate that organizations operating in turbulent fields (Emery & Trist, 1965), experience competing goals and performance demands, including, e.g., pressures to innovate and customize products and services, improve levels of responsiveness and speed, and increase productivity and efficiency (Daft, 1998; Mintzberg, 1979). These competing demands cause conflicting contingencies, which are endemic to complex open social systems (Gresov & Drazin, 1997). Cyert & March (1963) and Donaldson & Lorsch (1983) indicate that organizations face competing demands from a coalition of constituencies, representing, e.g., shareholders, customers, suppliers, employees and managers. Basic to the idea of a coalition of constituencies is the expectation that constituencies have substantially different preference orderings and aspiration levels (Cyert & March, 1963).

March (1988) indicates that organizations facing dynamic and complex environments indeed pursue multiple, often conflicting goals at the same time. Cyert & March (1963) provide the following vivid example, which is exemplary of the competing demands contemporary organizations face:

> *"Consider the case of a common pair of organizational demands within business organizations: (1) specific tailoring of product specifications and delivery times to individual customer needs - primarily from the sales department and customers; (2) product standardization and delivery times consistent with smooth processing - primarily from the production department and suppliers. In large part, these demands are logically inconsistent; one is satisfied at the expense of the other".*

March (1988) suggests, however, that while logically inconsistent, organizations may purposefully create ambiguity, and pursue multiple competing goals for creating strategic options:

> *"As we contemplate making choices that have consequences in the future, we know that our attitudes about possible outcomes will change in ways that are substantial, but not entirely predictable. As a result, we have a tendency to want to take actions now that maintain future options when future preferences are clearer".*

Sanchez (1997) indicates that organizations improve their success and survival in an uncertain environment by creating strategic flexibility that gives them the ability to pursue alternative course of actions in response to changing environmental conditions. According to Ashby's (1956) 'law of

requisite variety', if the environment is logically inconsistent - posing competing demands -, organizations will adopt a level of logical inconsistency that equals the environment. On the other hand, organizations may seek to create logical inconsistencies - pursue multiple competing goals and strategic flexibility - in order to offset competitors, and gain temporary advantages (D'Aveni, 1994). According to Donaldson & Lorsch (1983), management's belief systems provide a framework for thinking about the complex and uncertain choices they must make as they balance the conflicting demands of constituencies. Harrigan (1985) concludes that these belief systems are the main constraint in developing strategic flexibility.

4.3.2 Competitive & Competing Strategies

March (1991) describes two competing strategies for organizational adaptation to task environments, i.e., exploitation and exploration. *Exploitation* involves taking advantage of what is already known, i.e., cashing in on the investments made in existing capabilities. Exploitation seeks stability and control of existing resources. *Exploration* involves a search for new knowledge and capabilities, and seeks flexibility. Whereas exploitation builds forth on the efficient supply of extant products and services, exploration is geared at developing new products and services, in order to meet changing and ambiguous environmental demands. March (1991) concludes that exploration always involves uncertainty, but even under conditions of modest environmental change, some investment in exploration, and thus uncertainty, is essential to ensure long-term survival. Likewise, Volberda (1996) argues that environmental dynamism requires the ability to explore new opportunities effectively, and exploit existing opportunities efficiently. Therefore, organizations must determine the proper balance between these competing strategies for developing capabilities, and preserving organizational conditions (March, 1991; Volberda, 1996). Weick (1979) concludes that organizations continue to exist only if they maintain a balance between flexibility and stability, and thus exploration and exploitation.

Lawrence & Lorsch (1969) indicate that in successful organizations operating in a dynamic environment, innovation in products and processes, and responsiveness to customer demands is the dominant competitive issue, whereas in successful organizations operating in stable environments, regularity, efficiency and consistency in operations is the dominant competitive issue. Lawrence & Lorsch (1969) also indicate that while the latter is associated with relatively short time spans of definitive feedback and clear cause-effect relationships, the former is associated with longer time spans of feedback and less clear cause-effect relationships. Thus, change and innovation create more uncertainty for the organization.

Within any industry, companies seek to gain a competitive advantage that allows them to outperform rivals and achieve above-average profitability. Porter (1980) suggests that the path to competitive advantage is the successful implementation of an internally consistent competitive strategy. Porter (1980) identifies three generic, mutually exclusive competitive strategies, i.e.:

- *Cost Leadership strategy*: Companies pursuing a strategy of cost leadership seek to outperform rivals by producing goods or services at a lower cost. Due to the lower cost structure, the cost leader can either charge a lower price than competitors and still make the same profit, or charge the same price as competitors and make a higher profit. Cost leaders are usually in a better position to withstand price-driven competition. Emphasis is placed on reducing costs at every possible point. Hence, it may require designing products or services for ease of manufacture or delivery.
- *Differentiation strategy*: Companies pursuing differentiation strategies seek competitive advantage by creating products or services that are perceived by customers as being unique and for which buyers are willing to pay a premium price. Successful differentiation provides the company with two advantages: (a) the company is able to charge a higher price for its products or services, and (b) customers willing to pay more for a unique product are often more loyal because their purchase decision is based on perceived quality rather than price. Achieving successful differentiation requires clear understanding of customer needs and investments in the capabilities necessary to meet those needs.
- *Focus strategy*: The focus strategy is directed toward serving the needs of a limited customer group or market segment. Companies pursuing focus strategies concentrate on serving a particular market niche, which may be defined geographically, by segment of product line, or by type of customer. Having chosen its focus, however, the company may choose to compete within its niche either on the basis of low cost or differentiation. The advantages of successful focus strategies

derive from the fact that the firm is able to concentrate its efforts. Concentration within a protected niche may buffer the firm from broader competition within the industry as a whole.

Based on a study of 79 medium-sized, relatively undiversified, American manufacturing organizations, Khandwalla (1976) reports that if an environment is rich in contingencies, an organization's strategy is likely to be multiplex, i.e., comprehensive and multifaceted. Organizations in dynamic environments are characterized by goal diversity (multiple strategic goals) and flexibility (multiple conditionally applied heuristics, rather than single valued heuristics) (Khandwalla, 1976). Organizations in relatively stable environments are characterized by narrowness, singular specific heuristics, and focus on stability, control and conservatism. Khandwalla (1976) concludes that the effect of a dynamic and complex environment raises the importance of *multiple* strategic activities, including product innovation, efficient production, and customer marketing. Goal diversity, however, increases the output categories for which information needs to be collected and processed by the organization, thereby increasing both the complexity and uncertainty of the strategic context (Flynn & Flynn, 1999; Galbraith, 1973, 1994).

Miller (1979) and Miller & Friesen (1978) posit that organizations will adopt competitive strategies commensurate with the level of uncertainty in their environment. Miller & Friesen (1978) and Miller (1979) draw on Khadwalla's (1976) conclusion that a dynamic environment begets a multiplex - complex and comprehensive - strategy. Strategies will be more comprehensive and multifaceted, which pose a large number of challenges, opportunities, and risks to organizations. Building forth on previous conceptual and empirical studies (see Porter, 1980; Hofer & Schendel, 1978; Miles & Snow, 1978; Hambrick, 1983; Dess & Davis, 1983), Miller (1987; 1988) distinguishes the following competitive strategies:

- *Complex innovation* involves the degree to which the firm introduces major products and services, pursues novel opportunities in the marketplace, and leads competitors in product quality and functionality. This involves the application of new technologies, and unforeseen customer and competitor reactions. These features increase uncertainty for the organization.
- *Marketing differentiation* strives to create customer loyalty by uniquely meeting a particular need. Product appeal is psychological in that advertising and prestige pricing are used to create a favorable image and build a strong brand. Such appeals are made on the basis of quality, reliability and convenience, and require anticipating complex customer motivations and buying patterns. These features increase uncertainty for the organization.
- *Conservative control* involves the extent to which the firm tightly controls cost, refrains from incurring much innovation or marketing expenses, and cuts prices in selling standardized products. Efficiency and price-consciousness are the main drivers for conservative control. These features increase predictability and stability for the organization.
- *Strategic breadth* refers to the scope of the market that the business caters to, i.e., the variety of customers, the number of products, and the geographic range.

The results of the research[29] (Miller, 1987; 1988) indicate that for successful organizations - growth in income -, complex innovation and marketing differentiation are positively associated with dynamic and complex environments, while negatively associated with cost control. Furthermore, compared to complex innovation, marketing differentiation is significantly more associated with hostility. No significant difference is found for strategic breadth across successful and unsuccessful organizations. The results also indicate that in dynamic and complex environments, high performing organizations tend to pursue differentiation and cost strategies simultaneously. Contrary to Porter's (1980) mutually exclusive generic competitive strategies, Miller's (1987; 1988) study confirms earlier studies (Khandwalla, 1976; Miller & Friesen, 1978) that cost-leadership and differentiation strategies are not mutually exclusive.

Based on an extensive review of organization theories, and an empirical study on organizational effectiveness, Quinn & Rohrbaugh (1983), and subsequently Buenger et al. (1996), develop a framework of values that reflect basic organizational dilemmas of exploitation and exploration (March, 1991). The central tenet of the framework is that an organization is effective when it meets competing performance demands (Buenger et al., 1996; Quinn & Rohrbaugh, 1983; Quinn et al., 2000). Quinn & Rohrbaugh (1983) indicate that organizations face different sets of values, which may change over time

[29] The sample consisted of 110 Australian and Canadian companies across a heterogeneous sample of sectors.

due to internal and external influences and experiences. The framework represents competing management values in organizations, and distinguishes two dimensions, i.e., structure and focus (Figure 4.2). Management values refer to the strategic norms held of the environment, the organization and criteria for effectiveness (Buenger et al., 1996). The existence of these two dimensions was empirically validated[30] (Buenger et al., 1996; Quinn & Rohrbaugh, 1983).

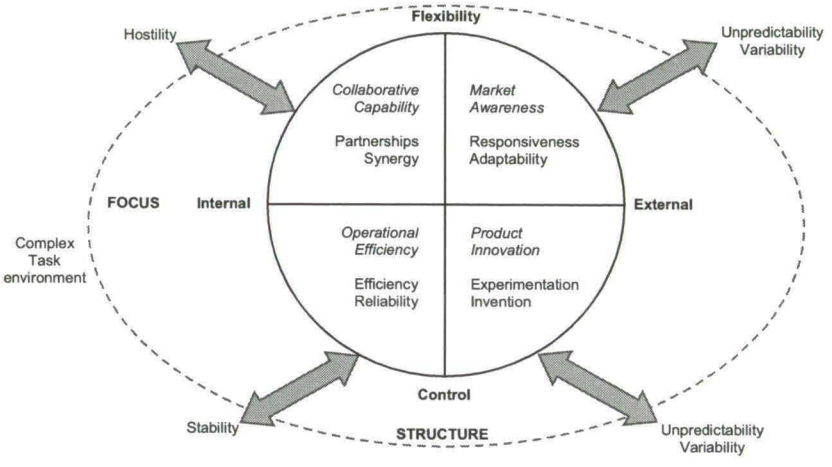

Figure 4.2. Competing values framework (Adapted from Buenger et al., 1996; Quinn & Rohrbaugh, 1983; Quinn et al., 2000).

Structure represents a preference for (a) stability and control, or (b) flexibility and change. *Focus* describes whether an organization seeks internal synergy versus external competitiveness. These dimensions form four competing value sets[31] (Buenger et al., 1996; Quinn & Rohrbaugh, 1983; Quinn et al., 2000):

- *Operational efficiency* (internal & control) focuses on improving process efficiencies, streamlining work-flows, maintaining high productivity, ensuring reliable performance, avoiding risks, and minimize work disruptions;
- *Collaborative capability* (internal & flexibility) focuses on sharing scarce -information and knowledge- resources, developing human resources, building partnerships, and attaining company wide synergies;
- *Product innovation* (external & control) focuses on innovation in products, services and processes, acquiring innovative and advanced technologies, and strategic experimentation;
- *Market awareness* (external & flexibility) focuses on adaptability and responsiveness to new and unexpected market demands, and flexibility in taking on new tasks

The results indicate that environmental uncertainty - instability - is associated with product innovation, whereas information scarcity - hostility - is associated with collaborative capability and product innovation. Resource scarcity - hostility - is associated with creating market awareness. Buenger et al. (1996) conclude that different elements of the environment are associated with competing 'value sets', and that organizations adopt different values in order to meet the different environmental demands. Complex and dynamic environments thus pose conflicting pressures and performance demands on organizations (Mintzberg, 1979).

[30] The research was conducted in 121 international divisions of the United States Air Force, involving 545 respondents (commanders, deputy commanders, and squadron commanders).

[31] Daft (1998) employs similar dimensions and distinguishes between four 'cultural value sets': (1) Entrepreneurial cultural - external/flexibility -, (2) Mission culture - external/stability -, (3) Clan culture - internal flexibility -, and (4) Bureaucratic culture - internal stability -.

Based on a longitudinal study of 80 market-leading companies[32], Treacy & Wiersema (1993; 1995) develop a similar model of 'value disciplines': (a) operational excellence, (b) product leadership, and (c) customer intimacy (Figure 4.3). Operational excellence describes the drive towards the provision of reliable products and services at competitive prices. Product leadership focuses on offering customers 'state-of-the-art' products and services that consistently enhance the customer's use of the product. Companies pursuing customer intimacy target markets and tailor offerings to match exactly, and anticipate the demands of customers.

Each value discipline has a dominant proposition and focus on (a) 'best cost', (b) 'best product', and (c) 'best solution'. Treacy & Wiersema (1995) develop their model based on the observation that organizations face competing demands in highly competitive environments. They argue that, and provide numerous examples how, market leaders excell in *at least* one value discipline, *and* meet a minimum threshold of competence in the other two. Treacy & Wiersema (1993) state that mastery of one discipline is often the standard in an industry, and market leaders have learned to master two value disciplines. Effective organizations focus and channel energy at excelling in a specific dimension of value, and maintain threshold standards on the other dimensions of value (Treacy & Wiersema, 1995).

Treacy & Wiersema (1993; 1995) indicate that each value discipline has threats if it is overemphasized, at the expense of other value disciplines. Operational excellence may lead to over-investments in streamlining and optimizing business processes. Product leadership may lead to emphasizing the latest technologies, for the sake of technology. Companies focusing on customer intimacy may persist in providing 'premium' services that have become 'standard' services over time. Similar to the story of the three blind men and the elephant, each value discipline only addresses part of the value framework. Treacy & Wiersema (1995) conclude that balancing the three value disciplines is, therefore, essential to achieving success in a volatile market place.

D'Aveni (1994; 1999) concludes that under these conditions, there is no sustainable competitive advantage based on either a low-cost strategy or differentiation strategy. Companies can only build temporary advantages in order to sustain strategic momentum through a series of initiatives, rather than achieve fit with the external environment. In dynamic environments strategic fit is fleeting and may even be 'fatal' for the organization (D'Aveni, 1994). In stead, D'Aveni (1994) argues, companies need to adopt simultaneous and sequential strategic thrusts, in rapid and surprising manners, in order to offset competitors, and create and satisfy customer needs. Rather than responding to the complexity, dynamism and intensity of competitive environments, D'Aveni (1994) suggests that organizations should create competitive disruptions.

Discipline	**Operational Excellence**	**Product Leadership**	**Customer Intimacy**
Proposition	'Best cost': Providing reliable products or services at competitive prices, and delivered with minimal inconvenience	'Best product': Offering customers leading edge products and services that consistently enhance the customer's use of the product	'Best solution': Segmenting and targeting markets precisely and tailoring offerings to match exactly the demands of those customers
Focus	Competitive prices, minimize overhead costs, reduce transaction costs, optimize business processes across functional boundaries, streamline workflows	Innovation, speed, state-of-the-art technologies, commercialization, short cycle times, time-to-market, selective controlled experimentation, directed 'grass root' developments	Customization of products and services, build customer loyalty and life-time value to the company, responsiveness, cultivate relationships and understanding, satisfy unique customer needs
Threshold	Operational Efficiency	Product tuning and enhancement	Customer responsiveness
Risk	'Efficient efficiency'	'Technology for technology'	'Ignorance'

Figure 4.3. Value disciplines and propositions (Treacy & Wiersema, 1993; 1995).

Thus, organizations in complex and dynamic environments face multiple competing contingencies. The previous studies confirm and support Khandwalla's (1976) original thesis and findings that an

[32] Treacy & Wiersema (1994) follow an inductive approach, i.e., their model is not explicitly grounded in theory, though their model does share many similarities with previous theoretical and empirical studies (cf. Porter, 1980; Miller, 1988; Quinn & Rohrbaugh, 1983).

environment rich in contingencies is associated with multiplexity. The strategic context is characterized goal diversity and strategic flexibility. This multiplexity creates uncertainty and ambiguity for the organization (Khandwalla, 1976; March, 1988), thereby requiring greater information processing capabilities (Galbraith, 1973). Consequently, as Boynton (1993) reports, organizations need to meet competing demands for (a) continuously delivering customized, high quality products and services, (b) compressing costs and time, to market products efficiently and quickly, and (c) developing and sharing expertise and other knowledge-based resources. Instability leads to innovation, hostility requires speed and efficiency, and variability begets flexibility. Innovation, efficiency, speed and flexibility thus become key value propositions in complex and dynamic environments (Quinn et al., 2000; Treacy & Wiersema, 1995). Galbraith & Lawler (1993) conclude that these conditions preclude the handling of complexity through organizational slack.

Organizations can create resource buffers through organization slack (March & Simon, 1958). Excess resources reduce the likelihood that inconsistent demands will be triggered by simultaneous failures to meet targets. Organization slack thus reduces the amount of interdependence and the need for joint decision-making and coordination (Cyert & March, 1963; Galbraith, 1973; Lawrence & Lorsch, 1969). Galbraith & Lawler (1993) indicate that contemporary environments characterized by hostility require speed and efficiency on the part of the organization, thereby excluding extensive use of organizational slack. While a viable strategy in the past, extending budget and time lines for the delivery of products and services will reduce performance in the long run (Galbraith, 1994). Organization slack is not a viable strategy in dynamic and complex environments, as it increases costs, and decreases the ability to provide customized services.

In summary, contemporary organizations do not have single goals, and face multiple, often conflicting, contingencies. Studies suggest that the 'low-cost versus differentiation' dichotomy is - currently - fallacious, as organizations are effectively pursuing both strategies simultaneously, in order to meet the competing demands of, and influence the competitive market place. Similar to the 'centralization versus decentralization' debate, the focus on cost leadership or differentiation strategies, has shifted towards a hybrid and refined perspective on balancing competing value sets (Figure 4.4). The competing values framework is conceptually related to Porter's (1980) generic competitive strategies. Operational efficiency and collaborative capability are subsets of cost leadership, conservative control and operational excellence, whereas product innovation and market awareness are subsets of product leadership/complex innovation and customer intimacy/marketing differentiation. As environments have become more complex and dynamic, so have the concepts used to make sense of these environments (Quinn & Rohrbaugh, 1983).

Cost Leadership		Differentiation	
Conservative Control		Complex Innovation	Marketing Differentiation
Operational Excellence		Product Leadership	Customer Intimacy
Operational Efficiency	Collaborative Capability	Product Innovation	Market Awareness

Figure 4.4. Multiple value sets of competitive strategy (Based on Porter, 1980; Miller, 1988; Treacy & Wiersema, 1993; Buenger et al., 1996;Quinn & Rohrbaugh, 1983; Quinn et al., 2000)

The strategic and integral role of IT in the design and development of IT-intensive organizations, suggests that these competing demands are not idiosyncratic of 'traditional' business functions, e.g., marketing, production. The infusion of IT in contemporary organizations makes the IT 'staff' function is a critical *business* function. Consequently, the governance of IT in contemporary business environments will experience multiple, conflicting contingencies. Studies indicate that the governance of IT is indeed facing competing demands in (a) delivering customized, high quality IT products and services, and (b) compressing costs, risks and time, in order to meet business needs in an (c) efficient and reliable and (d) flexible fashion (see Chapters 1 and 2). Whereas Information Governance traditionally focused on either efficiency or responsiveness, currently it faces multiple contingencies for speed and flexibility, and efficiency and reliability. The value propositions for innovation, efficiency, speed and flexibility are thus also posing competing demands and conflicting contingencies on the design of Information Governance. The implications for the design of Information Governance are discussed in the following section.

4.4 Differentiation & Integration

In section 4.3, the design logic of organizing was described. The design principles of division and differentiation, and coordination and integration were briefly presented. The organizing logic underlying the governance system is the division and coordination of decision-making units, in order to direct the operational system towards the realization of the goals of the organization (Nielen, 1993; Mintzberg, 1979; Ribbers, 1980; Simon, 1961).

In this section, the differentiation and integration of decision-making for IT - designing Information Governance - is discussed. In Section 4.4.1, the differentiation of decision making for IT is described. In Section 4.4.2, the need for integration is outlined, and in Section 4.4.3, the coordination of decision-making for IT, and the integration mechanisms hereto are described. In Section 4.4.4, a contingency approach is presented for matching differentiation and integration.

4.4.1 Differentiation of Decision Making for Information Technology

The division of the governance system revolves around the degree of centralization and decentralization of decision aspects in the decision-making system (Lorsch & Lawrence, 1970). Centralization refers to the concentration of decision-making in a single point in the organization, in which a single decision applies. The concentration of decision-making describes parallel centralization of decision-making in vertical and horizontal directions, i.e., decision-making for all decisions pertaining to a certain aspect rests with a single unit by virtue of a formal office (Mintzberg, 1979). In terms of Information Governance, this involves the centralization of decision-making for IT applications, IT development and IT infrastructure to corporate IT management (See Pattern *I*, Table 4.1). In this case, decision-making for the *complete* IT portfolio is centralized in parallel to a corporate office.

A governance system is decentralized when decision-making is dispersed, and different independent decisions are made simultaneously. The dispersion of decision-making describes parallel decentralization of decision-making in vertical and horizontal directions, i.e., decision-making for all decisions pertaining to a certain subject rests with multiple independent units (Mintzberg, 1979). Under these conditions, decision-making is organized in self-contained decision-making units. Parallel decentralization eliminates interdependencies between decision-making units, and lowers complexity and uncertainty by reducing information processing needs (Galbraith, 1973; Mintzberg, 1979). In terms of Information Governance, this involves the decentralization of decision-making for IT applications, IT development and IT infrastructure to different management units (See Pattern *X*, Table 4.1). In this case, decision-making for the *complete* IT portfolio is decentralized in parallel to multiple IT or business management units.

Table 4.1. Centralization and decentralization of decision-making for IT.

Patterns **IT functions**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	**IX**	**X**
Applications	CM	DT	CM	DT	DB	CM	DB	DT	DB	DT/DB
Development	CM	CM	DT	DT	CM	DB	DT	DB	DB	DT/DB
Infrastructure	CM	CM	CM	CM	CM	CM	CM	CM	CM	DT/DB
Single Strategic Contingency	Cost Strategy	←							→	Differentiation Strategy
Multiple Strategic Contingencies		→		Cost and Differentiation Strategies					←	

CM = Centralized Corporate (IT) Management (Corporate level);
DT = Decentralized Division-IT management (LoB/SBU level);
DB = Decentralized Business-Division Management (LoB/SBU level).

Parallel centralization and decentralization thus form two polar ends on a continuum (Mintzberg, 1979). Traditionally, the design of the governance system involved the complete centralization, or the complete decentralization of decision-making. Under conditions of a single contingency, organizations devise decision-making structures to meet a single functional demand (Gresov & Drazin, 1997). From a strategic contingency perspective, organizations following a low-cost leadership strategy, focusing on operational efficiency or collaborative capability, adopt a centralized decision-making system, in order to achieve efficiency, minimize costs and share resources (Buenger et al., 1996; Daft, 1998; Miller,

1988; Treacy & Wiersema, 1995; Porter, 1980). In this case, the cost-focused strategy is the single strategic contingency and centralization is the consistent governance design. Alternatively, if the organization adopts a differentiation strategy, focusing on product innovation or market awareness, organizations adopt a decentralized decision-making system, in order to foster responsiveness, commercialization and customization of products and services (Buenger et al., 1996; Daft, 1998; Mintzberg, 1979; Miller, 1988; Treacy & Wiersema, 1995; Porter, 1980).

Regarding Information Governance, studies indicate that organizations following a low-cost leadership strategy centralize decision-making for the *complete* IT portfolio, whereas organizations pursuing a differentiation strategy decentralize decision-making for the *complete* IT portfolio (Tavakolian, 1989; Brown, 1997; Brown & Magill, 1994). Single strategic contingencies thus lead to the centralization or decentralization of the complete IT portfolio, i.e., IT applications, IT development and IT infrastructure.

In contrast, *selective* decentralization, refers to the decentralization of a *specific* decision aspect, in which decision-making for different kinds of decision aspects rests with different *interdependent* decision-making units (Mintzberg, 1979). In selective decentralization, decisions are divided into sub-decisions and sub-units, thereby creating, interdependencies between the different specific decisions (Gresov & Drazin, 1997; March & Simon, 1958). Selective decentralization transpires in vertical or horizontal directions (Mintzberg, 1979):

- *Selective vertical* decentralization refers to the decentralization of a specific decision aspect *within* the scalar chain of command, i.e., within the line structure;
- *Selective horizontal* decentralization refers to the decentralization of a specific decision aspect *across* the scalar chain of command, outside the line structure.

Mintzberg (1979) indicates that when specific domain expertise - for e.g., marketing, production, research & development - becomes vital to decision-making, the 'line structure' becomes increasingly artificial, and eventually it is replaced by joint decision-making, in which decision-making is not solely based on position, but moreover, on the sharing of information and expertise.

With regard to Information Governance, vertical decentralization describes the decentralization of decision-making for IT from corporate IT management to division IT management, whereas horizontal decentralization describes the decentralization of decision-making for IT to business division management (Figure 4.5). *Selective vertical* decentralization for Information Governance is recognized in patterns *II*, *III* and *IV* (see Table 4.1). *Selective horizontal* decentralization for Information Governance is present in Patterns *V* and *VI*, in which decision-making for IT application and IT development is decentralized to business management. In patterns *VII* and *VIII*, decision-making for IT is selectively decentralized in both horizontal and vertical directions. Rockart (1988), and Sambamurthy & Zmud (1999) refer to horizontal decentralization of decision-making for IT to business management as the highest level of decentralization.

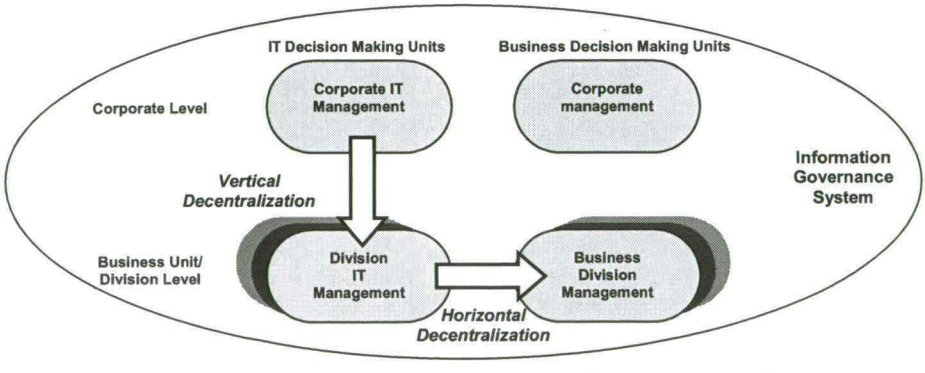

Figure 4.5. Vertical and horizontal decentralization of decision-making for IT.

With selective vertical and horizontal decentralization, the interdependencies among the different decision-making units increases (March & Simon, 1958; Mintzberg, 1979), thereby creating a complex system of reciprocal interdependence (De Leeuw, 1990; Thompson, 1967), consequently requiring greater information processing capabilities (Galbraith, 1973; Gresov, 1989). The reciprocal interdependency and the associated need for greater information processing between decision-making units is influenced by the interdependency between the IT sub-functions within the IT portfolio (Weill & Broadbent, 1998), and the interdependency between IT and business systems in the organization's operational system (Boynton et al., 1992; Sambamurthy, 2000).

Mintzberg (1979) indicates that conflicting strategic contingencies lead an organization to differentiate its governance structure, and to use selective decentralization in both vertical and horizontal dimensions. A hybrid decision-making system is thereby created characterized by both - selective - centralization and decentralization. Gresov & Drazin (1997) suggest that when an organization faces multiple conflicting contingencies, the organization will identify a subset of functional demands that minimize functional conflict, and match these demands with a set of appropriate structural features. The contingency conflicts are resolved through the creation of substructures and subdivisions. Units are subdivided in order to meet *multiple* demands, yet require re-integration in order to meet the *multiplexity* of demands (Gresov & Drazin, 1997). Daft (1998) and Tushman & O'Reilly (1996) state that organizations pursuing both cost and differentiation strategies simultaneously, differentiate their decision-making system in sub-units in order to meet competing goals of efficiency, cost reduction, innovation and client satisfaction. While the latter goals push the organization toward decentralization, the former goals pull the organization toward centralization (Mintzberg, 1979).

In summary, the emergence of the contemporary federal model for Information Governance reflects the resolution of conflicting contingencies through the division and redesign of the governance system. The decision-making system is subdivided to yield operational efficiency and synergy under the centralization of the IT decision-making, as well as innovation and responsiveness under the decentralization of IT decision-making. Goal diversity and the multiplexity of the strategic context lead to the design of a hybrid governance system of interdependent, centralized and decentralized decision-making units. This leads to the first of four propositions regarding the design of Information Governance:

> ***Proposition 1:***
> ***Goal diversity is associated with a hybrid decision-making system for IT, involving both centralized and decentralized decision-making units.***

4.4.2 From Differentiation to Integration

Cyert & March (1963) state that the selective decentralization of decision-making, and subsequent differentiation of goal attention limits the salience of conflicting demands. Selective decentralization, however, results in an increase in the bifurcation of interests and expectations among the decision-making units (Lorsch & Lawrence, 1970; March & Simon, 1958). Members of a subsystem develop a primary concern with the goals of coping with a particular sub-environment, and the division of decision-making thereby stimulates further goal differentiation and different mental models (Nonaka & Takeuchi, 1995; Senge, 1990) or frames of reference (Daft & Lengel, 1984; Lawrence & Lorsch, 1969; Schein, 1996). Frames of reference are 'internal standards' or 'cognitive filters' a person uses to describing or evaluate a situation (Van de Ven & Ferry, 1980). Frames of reference refer to a repertoire of tacit knowledge that is used to impose structure upon, and impart meaning to, otherwise ambiguous social and situational information to facilitate understanding (Gioia & Chittipeddi, 1991; Stillings et al., 1991). Tacit knowledge describes knowledge that is personal, context-specific, and difficult to articulate and communicate (Nonaka & Takeuchi, 1995).

While differentiation of sub-unit goals and the identification of decision-making units with sub-unit goals enables the organization to pursue conflicting goals in sequential, simultaneous, and satisficing manners (Cyert & March, 1963; March, 1988), they induce conflict and lead to equivocality within the governance system (Daft, 1998; March & Simon, 1958). With regard to Information Governance, research indicates that IT and business decision-making units indeed have different goal-orientations, preferences and expectations (Orlikowski & Gash, 1994; Nelson & Cooprider, 1996; Lind & Zmud, 1991; Luftman & Brier, 1999; Peppard & Ward, 1999; Reich & Benbasat, 1996; Weill & Broadbent, 1998). Consequently, conflicts between business and IT managers are often not uncommon in decision-

making for IT (Keen, 1991; Weill & Broadbent, 1998; Willcocks et al., 1997). March & Simon (1958) argue, however, that differentiated goal attention can be dealt with through the 'operationality of goals', i.e., making goals explicit and observable. The organization can thus counter goal differentiation by making goals explicit across decision-making units and developing mutual understanding (Lorsch & Lawrence, 1970).

While selective decentralization permits the organization to attend to multiple contingencies, it increases the complexity of interdependency, and the diversity of goal orientations within the governance system. Selective decentralization, and subsequent goal differentiation and interdependence, beget greater information processing needs, thereby requiring greater information processing capabilities on the part of the governance system (De Leeuw, 1990; Daft & Lengel, 1984; Galbraith, 1973, 1994; Lorsch & Lawrence, 1970; Thompson, 1967).

March & Simon (1958) indicate, however, that interdependency is a necessary, but not a sufficient condition to induce greater information processing, if the interdependency is stable and standardized. Tushman & Nadler (1978) and Mintzberg (1979) indicate that, compared to interdependency, uncertainty has a greater effect on the information processing needs. The uncertainty in the governance system, however, does not arise from within, but stems forth from the strategic context in the form of goal uncertainty induced by the value sets or value propositions in relation to the organization's strategic context. March (1988) states that exploration always involves uncertainty, whereas Lawrence & Lorsch (1967; 1969) and Miller (1979, 1988) indicate that strategies of differentiation and innovation create more goal uncertainty for the organization. Treacy & Wiersema (1995) and Buenger et al. (1996) also assert that value sets focused on product leadership and customer intimacy involve greater uncertainties. Under these conditions the time span of definitive feedback increases, and cause and effect relationships with regard to goal achievement are less predictable (Lawrence & Lorsch, 1967). The lack of information due to the difference between information possessed and information required creates uncertainty (Daft, 1998; Galbraith, 1973; Tushman & Nadler, 1978). Consequently, the governance system requires greater information processing capabilities.

Thus, both *goal diversity* and *goal uncertainty* in the strategic context pose greater information processing requirements on the governance system. In order for the governance system to realize the desired output, the information processing requirements need to be matched by information processing capabilities of equal complexity. Following Ashby's (1956) law of requisite variety, if the governance system experiences complex information processing demands, these demands need to be matched by equally complex information processing capabilities (Daft, 1998; Daft & Lengel, 1984; Galbraith, 1973, 1994; Lorsch & Lawrence, 1970; March & Simon, 1958; Tushman & Nadler, 1979).

The main proposition is that a match between information processing needs and information processing capabilities is a strong determinant of performance (Figure 4.6). The match between information processing needs and information processing capabilities is, however, functional in character and not structural. This axiom is the theoretical underpinning of Lawrence & Lorsch's (1967, 1969) thesis that the degree of integration should match the level of differentiation in order to achieve organizational performance effectiveness. In the following section, the mechanisms for integration are discussed.

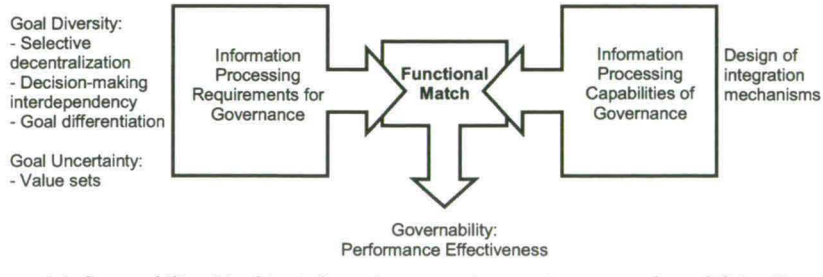

Figure 4.6. Governability: Matching information processing requirements and capabilities (Based on Tushman & Nadler, 1978; De Leeuw, 1990; Daft & Lengel, 1986; Galbraith, 1973; Lorsch & Lawrence, 1970; March & Simon, 1958).

4.4.3 Coordination & Mechanisms for Integration

Basic to the theory of governance is the coordination of decision-making systems (March & Simon, 1958; Lorsch & Lawrence, 1970; Ribbers, 1980). Different definitions and descriptions of coordination are presented in the literature (Figure 4.7). These definitions share several common elements, focused on *the purposeful - goal oriented - management of interdependencies between subdivided decision-making tasks and activities*. The definitions also focus on particular aspects of coordination. Ribbers (1980), similar to March & Simon (1958) and Lorsch & Lawrence (1970), emphasizes the adjustment of decisions regarding values of different decision aspects, whereas Andrews (1980) distinguishes between subdivided functions and interests.

Follet (1933) argued that there are three ways of settling differences in organizations: domination, compromise, and integration. According to Follet (1933), integration involves invention, and the finding of a third way, and describes a system of cross-functioning and a sense of collective responsibility. Integration, while related to coordination[33], is defined as the degree of collaboration and mutual understanding that exists among organizational sub-units that are required to achieve unity of effort in order to meet the goals of the organization (Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970). Besides integrative devices for interconnecting sub-units and inter-unit decision-making, integration involves the participative behavior of different actors to clarify differences and solve problems, in order to find integrative goal-oriented solutions (Lorsch & Lawrence, 1970). Consistent with Lawrence & Lorsch (1967, 1969), Lorsch & Lawrence (1970), and Ettlie & Reza (1992), integration is used to refer to both coordination and collaboration[34].

The creative side of the organization is coordination (Barnard, 1938)

Coordination is structuring and facilitating transactions between interdependent components (Chandler, 1962)

Coordination consists of the protocols, tasks and decision-making mechanisms designed to achieve concerted actions between interdependent units (Thompson, 1967)

Coordination describes the integrative devices for interconnecting differentiated sub-units (Lawrence & Lorsch, 1969)

Coordination describes the pattern of interunit decision-making (Lorsch & Lawrence, 1970)

Coordination means integrating or linking together parts of an organization to accomplish a collective set of tasks (Van de Ven et al., 1976)

Coordination is the way subdivided functions and interests are resynthesized (Andrews, 1980)

Coordination refers to the purposeful adjustment of decisions regarding values of different aspects (Ribbers, 1980)

Coordination is the act of managing interdependencies between activities performed to achieve a goal (Malone & Crowston, 1994)

Figure 4.7. Definitions and interpretation of coordination.

Different typologies exist to describe coordination. Literature converges on the existence of at least three distinct types of *general* (organizational) coordination (Figure 4.8).

Standardization and coordination by plan describes the use of standard programs, formal rules and procedures, and the specification of outputs, goals and targets (March & Simon, 1958). Galbraith (1973) distinguishes between coordination by rules, including the specification of behaviors and skills, and coordination by goals and targets. Thompson (1967) and Mintzberg (1979) also distinguish between the standardization of processes, outputs and skills. The IT infrastructure can serve as an operational standardization mechanism for business processes, and skills can be standardized by acquiring professionals or training IT personnel in specific areas of expertise. Alternatively, standard skills and knowledge can be sought outside the boundaries of the organizational unit. Budgets and

[33] Integration depicts an organization *development* perspective, whereas coordination is often used from organization *design* perspective (Barnard, 1938; Daft, 1998; Lorsch & Lawrence, 1970; Scott, 1998).
[34] This interpretation is discussed in the remainder of this section.

budget allocations for IT can be standardized, and outputs can be standardized in the form of service agreements and contracts between business and IT management (Weill & Broadbent, 1998).

Hierarchy describes the hierarchical referral of infrequent situations for which standardized programs have no solution (Galbraith, 1973). The hierarchy achieves coordination by having one person take responsibility for the work of others, issuing instructions and monitoring actions (Mintzberg, 1979). If the hierarchy gets overloaded, additional levels or positions can be added to the hierarchy. Assistants or positions in the direct line of authority can be added in order to reduce the span of control and allow closer communication. Moreover, the hierarchy is the basic coordination mechanism for containing interdependency (Thompson, 1967; Simon, 1961), and is also referred to as vertical coordination (Buenger et al., 1996; Van de Ven et al., 1976). Alternatively, vertical information systems, in the form of periodic reports, IT newsletters or executive information systems are used as vertical coordination mechanisms (Daft, 1998; Galbraith, 1973; Lawrence & Lorsch, 1967; 1969). Appointing and adding a Chief Information Officer or IT director to the hierarchy is an example of vertical coordination.

Mutual adjustment and coordination by feedback involve transmission of new information (March & Simon, 1958). Thompson (1967) and Mintzberg (1979) describe coordination by feedback as mutual adjustment, in which coordination is achieved through the spontaneous, simple process of informal communication. Daft (1998), Galbraith (1973, 1994) and Lawrence & Lorsch (1969) argue, however, that mutual adjustment and horizontal coordination are not simple, nor are they developed automatically. Under conditions of increasing uncertainty and complexity, organizations purposefully design lateral coordination. Horizontal coordination does not replace vertical coordination, but supplements standardization and the hierarchy (Mintzberg, 1979; Van de Ven et al., 1976; Lawrence & Lorsch, 1969).

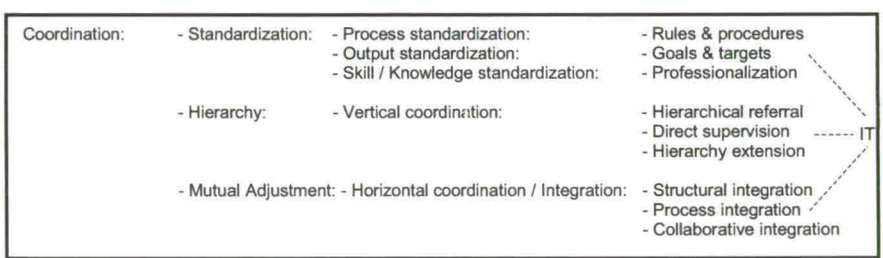

Figure 4.8. General typology of coordination mechanisms[35]
(Based on Daft, 1998; Galbraith, 1973; Mintzberg, 1979; Thompson, 1967).

Mutual adjustment and horizontal coordination - also referred to as internal networks or lateral relationships (Galbraith, 1994) - represent the most significant contemporary development in organization design (Daft, 1998; Galbraith, 1994; Mintzberg, 1979; Scott, 1998). Lateral coordination and integration mechanisms have recently been 'rediscovered' as strategic organizational capabilities in contemporary hypercompetitive environments (Galbraith, 1994; Grant, 1996; Hitt et al., 1998). Lawrence & Lorsch (1967) already described integration as a 'higher order capability'. Grant (1996) indicates that the essence of organizational capability is the integration of domain-specific expertise and tacit knowledge. From a resource-based perspective (Barney, 1991), lateral coordination is a resource that is hard to imitate, that cannot be purchased, and is time dependent and socially complex, involving multiple differentiated decision-making units (Hitt et al., 1998; Lawrence & Lorsch, 1967, 1969; Powell, 1992). In a competitive and dynamic environment, performance is driven by an organization's resources that are valuable and unique (Collis & Montgomery, 1995). Sustainability of competitive advantage therefore requires resources that are idiosyncratic, and not easily transferable or replicable (Grant, 1996). Galbraith (1994) postulates that the success of companies is dependent upon the organizational capability to coordinate across units.

Similar to the general typology of coordination mechanisms, a *specific* typology for integration and horizontal coordination is reported in the literature (Figure 4.9). Studies suggest the existence of a portfolio of layered integration mechanisms with increasing integrative capabilities, ranging from structural integration, to process integration, to collaborative integration (Daft & Lengel, 1984; Ellinger

[35] Note that Information Technology can be used for, and can facilitate different types of general coordination.

et al., 1999; Galbraith, 1994; Khan, 1996; Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970; Malone & Crowston, 1994).

Lawrence & Lorsch (1967; 1969) and Lorsch & Lawrence (1970) describe these levels as (a) structural integration devices, (b) joint decision-making processes and (c) collaborative working relationships. Whereas structural integration lays the organizational foundation for decision-making, process and collaborative integration describe the realized decision-making processes, and actual participation in decision-making (Lorsch & Lawrence, 1970). Galbraith (1994) employs a similar connotation, referring to the different integration levels as structural connection, communication processes and collaboration. Kahn (1996) refers to integration as a composite of interaction and collaboration. Interaction describes the structures and processes used for information-exchange and communication, whereas collaboration is described as the affective, participative and shared element of integration, corresponding to a willingness to work together (Kahn, 1996). Malone & Crowston (1994) describe these levels as a layered system of successively deeper levels of coordination.

According to Galbraith (1994), the integration levels depict a cumulative hierarchy, in which process integration builds forth on structural connection, and collaboration builds forth on process integration. The three types of integration mechanisms form a Guttman-type scale (Thompson, 1967), in which collaborative integration contains process integration and structural integration, and process integration contains structural integration. Higher levels of integration thus contain lower levels of integration (Galbraith, 1994; Galbraith & Lawler, 1993). These lower levels of integration describe a necessary, yet insufficient condition for achieving higher performance (Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970; Kahn, 1996; Kahn & McDonough, 1997; Kahn & Mentzer, 1998; Ellinger et al., 1999).

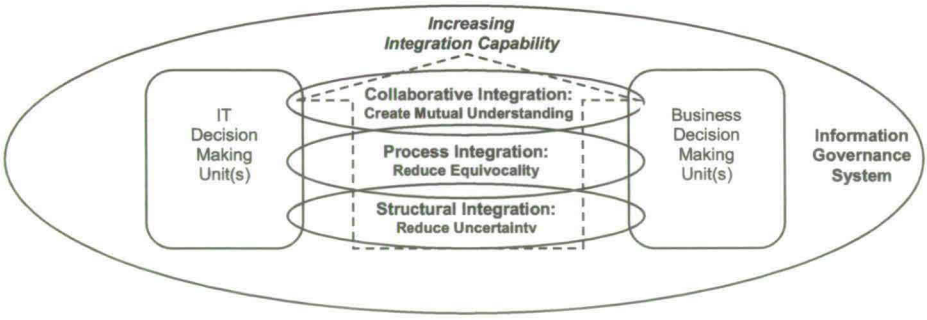

Figure 4.9. Multilevel portfolio of integration mechanisms.

The hierarchy of integration mechanisms is organized according to the rationale or motivation for horizontal coordination. The need to reduce uncertainty instigates structural integration, whereas the need to reduce uncertainty and equivocality instigates process integration (Daft & Lengel, 1984; Kahn, 1996). From an information processing perspective, structural integration describes the combination of (explicit) information in order to reduce uncertainty, while process integration describes the externalization and internalization of information in order to reduce equivocality (Daft & Lengel, 1984; Nonaka & Takeuchi, 1995). Collaborative integration, on the other hand, addresses the need to create mutual understanding (Lorsch & Lawrence, 1970), and describes the combination of (tacit) information. Nonaka & Takeuchi (1995) describe this process as socialization.

Whereas structural and process integration mechanisms tend to be mandatory, formal and tangible, collaborative integration is a voluntary process that cannot be mandated, programmed, or formalized, and is often intangible and tacitly present in the organization (Ellinger et al., 1999; Gray, 1991; Kahn, 1996; Mintzberg et al., 1997). Zmud (1984) indicates that these mechanisms are classified according to their capability to cope with greater uncertainty and complexity. Unidirectional and static mechanisms promote consistency and predictability, whereas multidirectional and dynamic mechanisms promote adaptability and flexibility (Zmud, 1984).

Structural integration mechanisms describe specific structural and infrastructural arrangements for linking sub-functions in the organization (Daft, 1998).

Structural arrangements include: **(a)** direct contact between stakeholders, **(b)** liaison positions - e.g., account or relationship managers -, **(c)** task forces - e.g., e-commerce impact analysis team - **(d)** steering committees e.g., - executive IT committee -, and **(e)** integrating positions - e.g., project manager, or program management office. These mechanisms are usually presented in the form of a continuum of integration mechanisms of increasing information processes capabilities and costs (Figure 4.10), i.e., steering committees provide more information processing capability than direct contact, yet are more expensive to implement (Galbraith, 1973, 1994).

	Lawrence & Lorsch '69	Galbraith '73	Mintzberg '79	Daft & Lengel '84 / '86	Galbraith '94	Daft '98
Low	Direct contact	Direct contact		Direct contact		Direct contact
	Liaison	Liaison	Liaison position			Liaison role
	Temporary cross functional team	Task force	Task force	Task force	Formal Groups	Task force
		Team		Team		
Information Processing Capability & Costs	Permanent cross functional team		Standing committee			Executive committee
	Integrating roles & departments	Integrator	Integrating manager	Integrator	Integrator roles	Integrator or integrating team
High		Managerial linking (formal authority)				

Figure 4.10. Continua of direct structural integration mechanisms.

Infrastructural arrangements describe human-resource practices, including **(f)** cross-training, **(g)** job-rotation, **(h)** performance rewards and **(i)** co-location, and **(j)** communication facilities, including e-mail and shared database systems (Table 4.2). Infrastructural arrangements are indirect integration mechanisms that facilitate and maintain cohesiveness (Barnard, 1938; Kahn, 1996). Galbraith (1994) concludes that indirect mechanisms increase the probability that important network relationships are created and used.

Table 4.2. Outline of indirect structural integration mechanisms (Based on Daft, 1998; DeSanctis & Jackson, 1994; Galbraith, 1994; Galbraith & Lawler, 1993; Hitt et al., 1998; Lawrence & Lorsch, 1969; Luftman & Brier, 1999; Ross et al., 1996).

Indirect structural mechanisms	Description
Cross-Training	Informal and formal cross-training of IT and business managers. Business managers develop IT expertise, whereas, IT managers develop business expertise. Cross-training also involves the development of social, technical, business and managerial skill sets for both business and IT managers
Job-rotation	Transfer or rotation of managers across different functions within and across departmental, functional and business unit boundaries. IT staff working in business function, business staff working in IT function.
Performance measurement and rewards	Performance measurement and rewards based on skill sets and achievement of coordination and group performance.
Co-location	Physical co-location of business and IT managers facilitates communication, interaction and coordination. Direct structural integration mechanisms may require closer physical proximity
Communication infrastructures	Information systems and communication networks used the collect, exchange and share data and information. Involve electronic document handling, mailing, conferencing, and discussion facilities (e.g., eMail, eCollaboration, GDSS, CSCW).

Process integration mechanisms for Information Governance are defined as the specification, integration and evaluation of strategic business decisions regarding IT (Henderson & Lentz, 1994; Weill & Broadbent, 1998). Process integration describes (a) the identification and formulation of the business case or 'business rationale' for IT decisions, and (b) the prioritization, selection and evaluation of IT decisions (Parker & Benson, 1988; Luftman & Brier, 1999; Sabherwal & King, 1995; Willcocks,

1996). Similar to structural integration, process integration is a multifaceted construct. Process integration mechanisms envelop strategic decision-making and strategic conversations (Lorsch & Lawrence, 1970; Van der Heijden, 1996).

Process integration mechanisms describe **(k)** the *comprehensiveness* of the IT decision-making process, and **(l)** the *integration* of business and IT decisions in the decision-making process. Comprehensiveness is defined as the extent to which an organization attempts to be exhaustive in making and integrating strategic decisions (Fredrickson, 1984; Fredrickson & Iaquinto, 1989). High comprehensiveness emphasizes the exhaustive analysis of information regarding alternatives, and the formal integration of decisions based on specified rules, procedures and formal methodologies or tools. Integration describes the *administrative* - budgets and schedules are pooled between business and IT-; *sequential* - business decisions provide directions for IT decisions -; *reciprocal* - business and IT decisions are mutually influential; or *full* integration - business and IT decisions are made concurrently - of business and IT decisions (Teo & King, 1996, 1997, 1999).

Process integration also describes **(m)** the resolution of conflicts and communication patterns between key stakeholders (Lawrence & Lorsch, 1967, 1969). Conflict is defined as the perception of goal incompatibility, and the interference with goal achievement (Daft, 1998; Robbins, 1994). Conflicts are resolved through the use of active and passive resolution strategies. Active conflict resolution involves confrontation and competition strategies, whereas passive conflict resolution involves avoidance and smoothing-over strategies, i.e., conflicts remain and are not explicitly resolved (Eisenhardt, 1989; Lawrence & Lorsch, 1969; Robbins, 1994).

Whereas traditionally comprehensiveness and conflict-resolution have been portrayed as competing models, studies indicates that the dimensions of *rationality* and *politicality* capture two conceptually and empirically distinct dimensions of strategic decision-making (Allison, 1971; Daft, 1998; Dean et al., 1991; Dean & Sharfman, 1996; Eisenhardt, 1989; Eisenhardt & Zbaracki, 1992; Lorsch & Lawrence, 1970; Mintzberg et al., 1976). Dean et al. (1991) and Dean & Sharfman (1996) indicate that the absence of rationality is not politicality, but non-rationality; and the absence of politicality is not rationality, but non-politicality. Strategic decision-making may contain neither, or politicality and rationality can co-exist. This proposition is also supported by previous IT decision-making studies (Doherty et al., 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998).

Lawrence & Lorsch (1969) and Lorsch & Lawrence (1970) were one of the first to recognize the simultaneous and complementary nature rationality and politicality in strategic decision-making. Lorsch & Lawrence (1970) describe rationality and politicality as 'patterns of interunit strategic decision-making', i.e., indicators of how managers in interdependent organizational units exchange information, resolve conflicts and make joint decisions. Eisenhardt & Zbaracki (1992) conclude that strategic decision-making is best described as a combination of rationally bounded and social-political insights. Bounded rationality shapes the cognitive limits and the political perspective shapes the social context. Allison (1971) indicates that much of the richness of strategic decision-making studies emanates from the use of competing - politicality and rationality - conceptualizations.

Collaborative integration mechanisms describe the degree of collaboration and mutual understanding between different decision-making units (Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970). Collaborative integration is defined as the process of joint decision-making among interdependent parties, involving joint ownership of decisions and collective responsibility for outcomes (Gray, 1991). Joint ownership describes the belief in the importance of the collaboration to the organization's success, a sharing of mutual commitment among stakeholders, and a willingness to support group decisions. Ellinger et al. (1999) add to this definition the coming together of diverse interests and people. Thus, although collaborative integration implies joint ownership of decisions and collective responsibility for outcomes, each stakeholder constituency maintains its individual orientation. This is the essence of 'integrated differentiation' or 'diversity in unity' (Lawrence & Lorsch, 1967, 1969).

Collaborative integration refers to a close, functionally interdependent relationship in which organizational units strive to create mutually beneficial outcomes. Henderson (1990) describes this as an - internal, cross-functional - *partnership*[36] that reflects a working relationship of long-term commitment, a sense of mutual collaboration, and shared risks and benefits. Ellinger et al. (1999) indicate that collaborative integration addresses informal behaviors, based on information and expertise sharing, that occur between interdependent organizational units.

Central to collaborative integration is the participative behavior of different stakeholders to clarify differences and solve problems, in order to find integrative solutions (Lorsch & Lawrence, 1970; Robbins, 1994). Liedtka et al. (1997) argue that the capability for inter-functional collaboration allows the organization to find broader solutions. According to Liedtka et al. (1997), collaboration unleashes the creativity involved in joint exploration solutions that transcend technical boundaries and define future possibilities. Gray (1991) and Liedtka et al. (1998) indicate that collaborative integration is characterized by its participative and shared nature. Specifically, collaborative integration addresses the voluntary participation and shared understanding between stakeholders involved in decision-making processes (Kahn, 1996). Collaborative integration mechanisms describe the **(n)** participation of business and IT stakeholders in the decision-making process, and **(o)** the shared understanding between business and IT management.

Participation is a process in which influence is exercised and shared among stakeholders, regardless of their formal position or hierarchical level in the organization (Lorsch & Lawrence, 1970; Wagner, 1994). Dyson & Foster (1982) define participation in decision-making as the act of actively taking part in the process of decision-making together with other stakeholders. Participative decision-making balances the involvement of stakeholders in information processing, decision-making and problem structuring/-solving. Participative or collaborative decision-making provides interactions necessary to develop rich interpretations of events and actions (Daft & Lengel, 1984; Scott, 1998). Liedtka et al. (1997) indicates that participative decision-making describes the extent to which the decision-making process gives a 'voice' to relevant stakeholders, and is critical to maintaining commitment of stakeholders.

Shared understanding is defined as the mutual understanding by members of organizational sub-units of each other's goals and objectives (Lorsch & Lawrence, 1970). Different terms have been used to covey the concept of shared understanding, including shared mental models (Parker et al., 1997; Senge, 1990), shared thought worlds (Griffin & Hauser, 1996), shared frames (Orlikowski & Gash, 1994), shared knowledge (Nelson & Cooprider, 1996), and collective minds (Weick & Roberts, 1993). Shared understanding addresses the *congruency* of reference frames of stakeholder constituencies involved in interdependent decision-making (Brockman & Anthony, 1998). March (1988) states that when stakeholders understand the perspectives of other stakeholders in decision-making, they can accurately interpret and anticipate actions, and coordinate adaptively. This is akin to a social-technical paradigm of information systems, in which IT managers need to comprehend the business context in which IT is or will be used (Bostron & Heinen, 1997).

Within the context of Information Governance, shared understanding describes the mutual understanding of business and IT objectives and plans by business and IT executives (Henderson, 1990; Reich & Benbasat, 1996; Weill & Broadbent, 1998). This includes an understanding and appreciation among business and IT executives for the processes and technologies that affect their mutual performance (Nelson & Cooprider, 1996). Shared understanding between business and IT managers does not address the details of each other's activities and skill bases, but of the other's objectives, concerns and needs (Keen, 1991). Reich & Benbasat (1996) refer to shared understanding as 'social linkage', defined as (a) business executive's understanding of IT objectives, and (b) IT executive's understanding of business objectives (Figure 4.11).

[36] Different authors equate collaborative integration, or collaboration with the concept of partnership (Griffin & Hauser, 1996; Kahn, 1996; Liedtka et al., 1997; Mintzberg et al., 1997). Given the wide-spread use and association of the term 'partnership' with studies on inter-organizational relationships and (IT) outsourcing, and the focus of this study on intra-organizational/inter-functional decision-making, the term collaboration is used in this study. However, it is acknowledged that partnerships is also used within the context of intra-organizational relationships (see e.g., Henderson, 1990; Parker et al., 1997), and that collaboration is also used within the context of inter-organizational (Business-to-Business) relationships (see e.g., Ettlie & Reza, 1992; Lawrence, 1999; Scott, 2000)

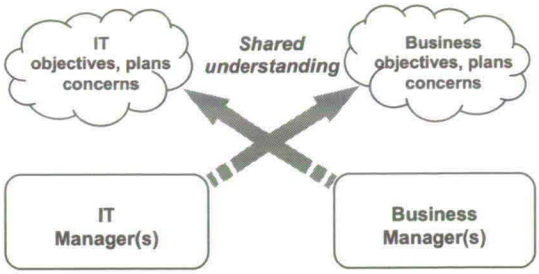

Figure 4.11. Shared understanding between Business and IT management.

Parker et al. (1997) also indicate that shared understanding should adequately represent business and IT variables:

> *"Business managers must include information needs and the business impact of technology in their mental models for guiding the business. IT managers must include the business management variables in their mental models for effectively deploying IT".*

Shared understanding is formed when people in close collaboration enact a single memory, *with differentiated competencies and responsibilities* (Weick & Roberts, 1993). Shared understanding resides in specialized relationships among stakeholders, and in particular, the information flows and decision-making processes that shapes their dealings with each other (Lorsch & Lawrence, 1970). Parker et al. (1997) argue that identifying acceptable solutions to ambiguous problems in complex and dynamic environments, requires the collaboration of different stakeholders, working with different paradigms, and offering different insights. This facilitates decision-making problem recognition and decision-making problem resolution through the social integration of decisions (Brockman & Anthony, 1998). Eisenhardt (1989) concludes that this decision integration does not imply any sort of elaborate planning; rather, fast decision-makers maintain a cognitive map that they can readily describe.

Orlikowski & Gash (1994) also conclude that these cognitive maps or frames are flexible in structure and content, having variable dimensions that shift in salience and content by context and over time. Shared understanding is inherently dynamic, and is structured more as webs of meaning, than as linear ordered graphs (Gioia & Chittipeddi, 1991; Orlikowski & Gash, 1994). The development of a collective mind or shared understanding results in coordinated decision-making and collaborative relationships, which is particularly relevant and beneficial when the need for reliability is high, and decision-making is non-routine, involving interactive complexity, i.e., the combination of complex interpersonal interactions with a high degree of interdependence (Weick & Roberts, 1993). Under these conditions, coordination in the form of structural and/or process integration are insufficient means for achieving integration (Kahn, 1996; Galbraith, 1994; Weick & Roberts, 1993).

The different types of structural, process and collaborative mechanisms for integration are summarized in Table 4.3.

Table 4.3. Summarized Overview of Structural, Process and Collaborative Mechanisms for Integration.

Integration	Capability	Mechanisms	Organization Studies	IS Studies
STRUCTURAL	Static / Low			
		(a) Direct contact (b) Liaison role/Account Manager (c) Task force/Project team (d) Steering/Executive committee (e) Integrating function/Program manager (f) Cross-training (g) Job-rotation (h) Performance rewards (i) Co-location (j) Communication infrastructure	Lawrence & Lorsch Galbraith Daft Mintzberg Hitt et al Liedtka	Elam et al Feeny et al Luftman & Brier Clark et al Cross et al Ross et al Henderson Weill & Broadbent Zmud Rockart et al Reich & Benbasat
PROCESS				
		(k) Decision making comprehensiveness (l) Decision Making Integration (m) Conflict resolution	Simon Daft Mintzberg et al Cyert & March Eisenhardt & Zbaracki Dean et al Lorsch & Lawrence	Henderson & Lentz Weill & Broadbent Parker & Benson Willcocks Teo & King
COLLABORATIVE	Dynamic / High			
		(n) Stakeholder participation (o) Shared understanding	Lawrence & Lorsch Gray Mintzberg et al. Kahn Wagner Liedtka et al	Parker et al Henderson Reich & Benbasat Weill & Broadbent Orlikowski & Gash Nelson & Cooprider

4.4.4 Matching Differentiation and Integration: A Contingency Approach

March & Simon (1958) state that the more stable and predictable the situation, the greater reliance on coordination by plan, whereas the more variable and unpredictable the situation, the greater the reliance on coordination by feedback. Moreover, the greater the interdependence of timing activities, the greater the need for coordination by feedback (March & Simon, 1958). Galbraith (1973, 1994) contends that as the level of uncertainty increases, the organization will need to make more use of mutual adjustment and horizontal coordination. As the required information processing capabilities become more complex, the hierarchy becomes inadequate for effective decision-making, and additional - horizontal - integration mechanisms must be established (Daft, 1998; Galbraith, 1973, 1994; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970).

Due to complex interdependencies, Mintzberg (1979) posits that selective decentralization of decision-making requires the use of liaison devices, and mutual adjustment is the primary means of coordination. Daft (1998) and Galbraith (1994) also state that horizontal coordination across hierarchies and stakeholder constituencies is the focal concern in hybrid organizations characterized by centralized and decentralized decision-making units. Daft & Lengel (1984) indicate that high interdependency and high equivocality require mutual adjustments and the use of horizontal coordination mechanisms. Horizontal coordination devices accommodate the dual needs for uncertainty and equivocality reduction (Daft & Lengel, 1984; Zmud, 1988). Likewise, Lorsch & Lawrence (1970) indicate that where differentiation is high, and the pattern of interdependence is complex, more elaborate horizontal integrative devices need to be applied.

Within the context of Information Governance, Parker et al. (1997) indicate that complex organizations characterized by distributed IT decision-making, require a sharing of responsibilities and perspectives, if they are to coordinate decisions and adapt to changing circumstances. Brown & Magill (1998), DeSanctis & Jackson (1994) and Sambamurthy & Zmud (1999) concur, and indicate that in federal models of Information Governance, horizontal coordination across decision-making units is the main concern. Moreover, the coordination and integration of business and IT decision-making is a relationship-specific asset, and a strategic organizational capability for business value appropriation

from IT (Applegate et al., 1999; Clark et al., 1997; El Sawy et al., 1999, Feeny & Willcocks, 1999; Mata et al., 1995; Ross et al., 1996).

Following previous conclusions that selective decentralization and goal uncertainty pose greater information processing requirements on the governance system (see Section 4.4.2), and thus require greater information processing capabilities through the use of horizontal integration mechanisms (see Section 4.4.3), the following propositions are formulated:

> ***Proposition 2:***
> ***Selective decentralization of Information Governance is associated with the use of (supplementary) horizontal integration mechanisms.***
>
> ***Proposition 3:***
> ***Goal uncertainty in the strategic context is associated with the use of (supplementary) horizontal integration mechanisms.***

Low levels of differentiation in the Information Governance system involve solely IT decision-making units and managers (see Section 4.4.1). Managers in IT decision-making units share the same professional background and work environment, and therefore experience less differentiating goal-orientations and reference frames (Lind & Zmud, 1991; Nelson & Cooprider, 1996; Orlikowski & Gash, 1994; Weill & Broadbent, 1998). Goal-orientations and working practices are less variable within organizational units, then they are across different organizational units (Daft, 1998; Lawrence & Lorsch, 1967, 1969; Schein, 1996; Scott, 1998; Van de Ven & Ferry, 1980). Structural and process integration may therefore suffice in order to coordinate and integration decision-making for IT.

However, as business decision-making units engage in decision-making for IT - vertical and horizontal decentralization -, differences in goal-orientations and working practices proliferate, and the level of differentiation in the Information Governance system increases. Consequently, higher levels of integration capability, i.e., collaborative integration, are necessary for achieving organizational effectiveness. Following Lawrence & Lorsch's (1967; 1969) central thesis that differentiation needs to be matched by adequate integration for achieving organizational effectiveness, and based on previous studies that higher levels of differentiation require higher levels of integration for high performance (Ellinger et al., 1999; Galbraith, 1994; Griffin & Hauser, 1996; Gupta et al., 1986; John & Rue, 1991; Kahn, 1996; Kahn & McDonough, 1997; Kahn & Mentzer, 1998; Olson et al., 1995; Powell, 1992; Song et al., 1993), the following proposition is formulated:

> ***Proposition 4:***
> ***Higher levels of IT decision-making differentiation require higher levels of IT-decision-making integration in order to realize IT business value.***

4.5 Strategic Outcome: IT Business Value

In the foregoing sections, several references were made to organizational performance and organizational effectiveness[37]. From a general systems perspective of organizations, organizational performance and effectiveness describe the outcome of the organization, and the appropriateness of the organizational output of transformational processes in meeting the demands of the environment (Daft, 1998; Galbraith, 1994; Galbraith & Lawler, 1993; Katz & Kahn, 1966; Lawrence & Lorsch, 1967; Nadler & Tushman, 1998). In contingency theories and contingency-based studies of organization and IT, organizational performance and effectiveness are regarded as the 'ultimate' dependent variable (Cameron, 1986; Daft, 1998; Mintzberg, 1979; Van de Ven & Ferry, 1980; Weill & Olson, 1989).

[37] Organizational performance and organizational effectiveness are used interchangeably (Galbraith, 1994; Nadler & Tushman, 1998). Whereas 'organizational - or business - performance' is conceptually rooted in strategic management theory/research (e.g., Dess & Robinson, 1984; Kaplan & Norton, 1996), organization design theory/research employs the term 'organizational effectiveness' (e.g., Daft, 1998; Scott, 1998; Quinn & Rohrbaugh, 1983). An exception to this general observation is Lawrence & Lorsch's (1967) study on differentiation, integration and organizational performance. One could argue that whereas organizational performance is a 'value neutral' construct, organizational effectiveness is a 'value laden' construct, i.e., all organizations perform and execute activities, yet it is only until a reference frame - a set of criteria - is added to organizational performance, that a value judgment can be made with regard to organizational effectiveness (Cameron, 1986; Van de Ven & Ferry, 1980; Quinn & Rohrbaugh, 1983). Organizations can thus perform effectively or ineffectively, or simultaneously effective and ineffective depending upon the standard or criteria, and the respondent's aspiration levels.

Cameron (1986). Quinn & Rohrbaugh (1983) indicate that organizational effectiveness is the central theme in organization design, and that it is difficult to convey a theory of organization that does not include the construct of organizational effectiveness.

Scott (1998) indicates that the topic of organizational effectiveness and performance has become salient in recent years due to the changing nature and increased intensity of competition. Over the past decades, however, organizational performance and organizational effectiveness have been the center of much debate and discussion (Cameron, 1986; Galbraith & Lawler, 1993; Kaplan & Norton, 1996; Quinn & Rohrbaugh, 1983). Quinn & Rohrbaugh (1983) conclude that the literature on organizational effectiveness is in disarray. Discussions have focused on finding a single definition of organizational effectiveness, and a sufficient set of organizational effectiveness/performance indicators. However, as Cameron (1986) argues, because no conceptualization of an organization is comprehensive, no conceptualization of an effective organization is comprehensive. Ashby (1956) argues that there is no such thing as a 'good' organization in any absolute sense.

Cameron (1986) indicates that consensus regarding the best set of indicators of effectiveness is impossible to obtain. Criteria and standards are based on the values, preferences and aspiration levels of individuals, and no specifiable construct boundaries exist (Cameron, 1986). Organizational performance/effectiveness is a multidimensional construct that relates to many domains of activity within the organization (Cameron, 1986; Galbraith & Lawler, 1993; Kaplan & Norton, 1996; Quinn & Rohrbaugh, 1983; Van de Ven & Ferry (1980). Van de Ven & Ferry (1980) indicate that a universal operational definition of organization effectiveness is unlikely, if not impossible to obtain. They suggest that one will more likely obtain many different, often conflicting definitions, criteria and standards of effectiveness, which reflect the unique value judgments of various stakeholder constituencies.

Preferences and value judgments vary over time, across stakeholder constituencies, and organizational levels, and are often implicit and conflicting (Cameron, 1986; Cyert & March, 1963). Value judgments revolve around questions of what goals, criteria, and standards should be chosen to assess organizational performance (Van de Ven & Ferry, 1980). The setting of standards establishes the criteria for assessing organizational performance, in which criteria serve as a reference point for evaluation (Scott, 1998).

Van de Ven & Ferry (1980) argue that the limited external validity of any operational definition of organizational effectiveness makes the comparative analysis of different types of organizations difficult in terms of organizational effectiveness. Such comparisons, however, seem viable only when organizations under investigation have similar tasks, products, or services, i.e., organizations within the same industry (Dess & Robinson, 1984; Lawrence & Lorsch, 1967; Van de Ven & Ferry, 1980). Weill (1992) and Chan & Huff (1992) also contend that IT and organizational performance should be studied within, and not across industries.

According to Cameron (1986), Dess & Robinson (1984), and Van de Ven & Ferry (1980), research that incorporates organizational performance/effectiveness must address two basic issues: (a) the selection of a conceptual model from which to define organizational effectiveness, and (b) the identification of measures that operationalize organizational effectiveness. The remainder of this section addresses these two issues. In section 4.6.1, different conceptual models of organizational effectiveness are discussed. In section 4.6.2, indicators of IT business value are discussed.

4.5.1 Organizational Effectiveness Models

Organizational effectiveness is a multidimensional construct, and different, equally valid, conceptual models and perspectives exist to assess organizational performance. Literature converges on the existence of seven conceptual frameworks of organizational effectiveness (Table 4.3). Conceptually however, the different models can be integrated. As Daft (1998) indicates, the Strategic Constituency model handles several perspectives simultaneously, and acknowledges that there is no single measure of organizational effectiveness. Stakeholders have different goals and aspiration levels, which may or may not be competing. Based on Cyert & March (1963), Dess & Robinson (1984) assert that if aspirations are used to guide actions, the actual results of these actions can be measured relative to the desired ends. The Competing Values model depicts a balanced view of perspectives, including financial and non-financial measures relating the resource acquisition, internal processes and outputs.

Subsequently, if strategic constituencies identify similar goals and criteria, a comparative analysis of organizations is conducted (Lawrence & Lorsch, 1967, 1969).

Table 4.3. Conceptual Models of Organizational Effectiveness (Based on Cameron, 1986; Daft, 1998; Kaplan & Norton, 1996; Scott, 1998; Quinn & Rohrbaugh, 1983; Venkatraman & Ramanujam, 1987).

Conceptual Model	Definition An organization is effective to the extent that:	Use The model is preferred and used when:
Rational Goal (RG)	*It accomplishes its stated goals*	*Goals are clear, consensual, and time-bound*
System Resource (SR)	*It acquires needed resources*	*A clear connection exists between inputs and outputs*
Internal Process (IP)	*It has an absence of internal strain and smooth internal functioning*	*A clear connection exists between organizational processes and performance*
Strategic Constituency (SC)	*All strategic constituencies are at least minimally satisfied*	*Constituencies have powerful influence on the organization, and it has to respond to demands*
Competing Values (CV	*Competing constituency needs are fulfilled*	*Competing values, and change in criteria expected over time*
Balanced Scorecard (BS)	*Operational and financial objectives and targets are achieved*	*Linking long-term strategic objectives with short term actions*
High Performing (HP)	*Judged excellent relative to other similar organizations*	*Comparisons among similar organizations are desired.*

Consistent with the discussion of the strategic context of Information Governance (see Section 4.3.2), this study draws on the Strategic Constituency model, extended with the Competing Values model, to assess organizational effectiveness, and the contribution of IT to organizational performance. Specifically, through the use of the Competing Values model, this study focuses on the objectives and aspiration levels of business and IT executives within financial service organizations. The High Performing model is used to conduct comparative analyses among the financial service organizations involved in this study.

Whichever conceptual framework is chosen to assess organizational performance, the question of valid and reliable performance measures remains. Much effort has been spent in comparing objective versus subjective measures of organizations and organizational performance (Van de Ven & Ferry, 1980). Objective measures are defined as those measures that require only a direct assessment of organizational properties without any conceptual transformation. Subjective self-report measures require an indirect assessment of organizational properties by instruments that measure group perceptions. Traditionally, research focused solely on the use of objective, quantitative financial data to assess organizational performance (Cameron, 1986; Daft, 1998; Kaplan & Norton, 1996; Scott, 1998; Quinn & Rohrbaugh, 1983), based on the belief that these are more valid and reliable. Venkatraman & Ramanujam (1987) indicate that no approach is intrinsically superior. Van de Ven & Ferry (1980) assert:

> *"The belief that they* [objective measures] *are generally more reliable and valid than subjective measures is patent nonsense, particularly when considering the sloppy ways many organizations score or keep track of their reporting systems, the fudging of data that occurs daily, the shifts in administrative reporting directives, the need to look good to higher executives and funding sources, and the need to prevent law suits. These practices reflect the fact that a variety of different frames of reference and intentions are involved when organizational members enter data into organizational records that may be functional for some organizational purpose, but not for basic or applied evaluation research purposes. Indeed, there are many instances where subjective measures that ask respondents directly and in confidence what goes on within the organization may yield more accurate data than objective measures".*

Subjective measures do not replace objective measures, but are meant to complement objective measures. In some instances, when objective measures are not available, the only viable approach may

be to use subjective measures (Van de Ven & Ferry, 1980). In their seminal study on differentiation, integration and organizational performance, Lawrence & Lorsch (1967, 1969) found significant correlation between objective and subjective measures of organizational performance. Similar results have been reported by Lorsch & Lawrence (1970), Dess & Robinson (1984), Venkatraman & Ramanujam (1987), Smith et al. (1989), and Powell (1992). Dess & Robinson (1984) indicate that subjective measures are particularly relevant when assessing non-financial/operational measures of organizational performance. Venkatraman & Ramanujam (1987) and Powell (1992), on the other hand, indicate that perceptual data from senior managers can also be employed as acceptable operationalizations of economic business performance.

Moreover, irrespective of the convergent validity between objective and subjective performance measures, gaining insight and understanding of stakeholders' perceptions of performance can be regarded as important. Previous studies indicate that stakeholders' perceptions are key to understanding why organizations adopt new Information Governance structures, and how IT affects organizational performance (Boynton et al., 1994; Broadbent & Weill, 1993; Brown, 1997; Jarvenpaa & Ives, 1991; Reich & Benbasat, 1996).

There are, however, criteria that apply to the use of subjective measures. Particularly, two criteria are recommended (Chan & Huff, 1992; Dess & Robinson, 1984; Van de Ven & Ferry, 1980):

- The use of multiple key informants;
- The selection of organizations within industries, and not across industries whenever possible.

In this study, both guidelines are followed, i.e., business and IT executives - multiple informants - in financial service organizations - single industry - serve as key informants.

4.5.2 IT Business Value Indicators: An Information Governance Perspective

The relationship between IT and organizational effectiveness - or business performance - has been under scrutiny for a number of years. Numerous studies have been conducted on the business value of IT, and the business payoff from investments in IT (e.g., Barua et al., 1995; Brynjolfsson & Hitt, 1995; Hoogeveen, 1997; Mahmood, 1993; Strassmann, 1990; Weill, 1992), yet results are inconsistent, and no definitive conclusions can be drawn (Kauffman & Weill, 1989; Chan, 2000). Brynjolfsson (1993) identifies at least four reasons for the controversy, including (a) measurement problems, (b) time lags between IT investments and IT impacts, (c) redistribution of outputs within an industry, and (d) mismanagement of IT. While an extensive discussion of the 'IT productivity paradox'[38] (i.e., the perceived lack of increased output resulting from investments in IT), is beyond the scope of this study, the theoretical and empirical models upon which IT business value studies are based, and the lessons learned from these studies, provide an important input for operationalizing the dependent construct in this study, i.e., business value appropriation from IT, or simply IT business value[39].

In general, business value is based on improving business performance. IT business value is defined as the contribution of IT to improved business performance (Parker et al., 1988; Soh & Markus, 1995). Parker et al. (1988) state that change is the basis for value in information technology. They assert that the real benefit of information technology comes from change in the business, including, e.g., innovations in products, markets, services, and organizational and managerial structures. Likewise, Benson (1994) argues that the achievement of business value depends not on the successful technical implementation of a system, but on the change of the business itself. The business value of IT lies in its application, and the purpose is to change and improve the business (Benson, 1994). Barua et al. (1995) also conclude that the most significant contributions of IT occur at the organizational level where IT is implemented and induces business change.

This organizational (change) perspective, however, is in stark contrast with the micro-economic model and production function approach propagated and employed in many IT business value studies. The micro-economic model employs a paradigm of a production function which relates input resources with output products or services, in which the ultimate goal of the firm is to maximize economic profit (Katz & Rosen, 1991). Based on an extensive review of IT business value studies, Chan (2000) concludes that an organizational model of IT business value has not been the norm, and is probably a fifth reason why the relationship between IT and business value remains elusive (Barua et al., 1995; Soh & Markus,

[38] The 'IT productivity paradox' can be studied at the organizational, industry and national level.
[39] IT business value is also referred to as IT value (Chan, 2000).

1995). The micro-economic model of IT business value treats organizational processes as a 'black box', and the conversion of IT investments (inputs) into business value (profitability) as an automatic process without wastage, thereby implying a static and unrealistic view of organizations (Chan, 2000; Crowston & Treacy, 1986; Davern & Kauffman, 2000; Weill, 1992). Barua et al. (1995) state:

> *"By attempting to relate IT expenditures directly to output variables at the level of the firm (such as market share) through an microeconomic production function, the intermediate processes which IT impacts are ignored. There has been a growing concern that the effects of IT on enterprise level performance can be identified only through a web of intermediate level contributions. In fact, there is some evidence that IT impacts exist, and that they can be detected when the analysis is executed at a lower level in the firm (i.e., at the strategic business unit (SBU) stage, or within the SBU rather than at the corporate level)".*

Parker et al. (1988) concur, and indicate that the business value of IT needs to be measured at the strategic business unit level. Whereas the micro-economic model views inputs as necessary and sufficient conditions for achieving outputs, the organizational model takes a process view of intermediate level performance contributions (Barua et al., 1995; Soh & Markus, 1995). Daft (1998) and Galbraith & Lawler (1993) indicate that the assessment organizational effectiveness should take into account both sub-unit (intermediate) and organizational performance goals. Scott (1998) argues that process measures are more valid measures of the characteristics of organizational performance. Whereas financial outcome measures are lagging indicators of performance, organizational process measures are leading indicators of future potential organizational performance (Kaplan & Norton, 1996; Scott, 1998). Barua et al. (1995) indicate that intermediate performance - first order effects - affect higher level business value - second order effects -. This is similar to Kaplan & Norton's (1996) conclusion that operational measures are drivers of (future) financial performance.

Different organizational models of intermediate process performance measures - IT business value linkage models - have been developed for gaining a better understanding of the business value of IT (Table 4.4). IT business value linkage models consist of two interdependent domains, i.e., IT performance measures and business performance measures. The business domain describes (financial) business measures and business impact/operational-change measures. The IT domain describes IT assets containing two distinct performance measures, i.e., (a) internally, technical-oriented, operations-based measures, and (b) externally, business-oriented, service-based measures. Weill & Broadbent (1998) state that high IT business value is characterized by a positive impact on all four levels; low IT business value only shows a slight positive impact at the lower (IT domain) levels.

Table 4.4 Overview of IT business value linkage models.

Author	IT Domain Performance Measures		Business Domain Performance Measures	
Sambamurthy & Zmud (1994)			*IT impacts* E.g., business process transformation, dynamic organizational structures	*Business Value* E.g., customer satisfaction, market share
Barua et al. (1995)			*IT impacts* E.g., product quality, product innovation	*Business Value* E.g., market share, ROA
Soh & Markus (1995)	*IT Assets* E.g., infrastructure flexibility and application suitability		*IT impacts* E.g., redesigned business processes, product/service innovation	*Business Value* E.g., profitability, stakeholder value
Nelson & Cooprider (1996)	*IT Operations* E.g., effectiveness and efficiency of internal work product	*IT Services* E.g., customer service, responsiveness		
Van der Zee (1996)	*IT Supply Efficiency/Effectiveness* E.g., IT delivery	*IT Effectiveness* E.g., IT business support	*Business Value - Business Performance* E.g., customer satisfaction, new product sales	*Business Value - Financial Performance* E.g., cost reduction, revenue growth
Weill & Broadbent (1998)	*IT Infrastructure Business Value* E.g., infrastructure availability, reliability	*IT Applications Business Value* E.g., cost/time to implementation	*Operational Business Value* E.g., time-to-market, product/service quality	*Financial Business Value* E.g., revenue growth, market share

Based on the Information Governance framework, the linkage between IT domain performance measures and business domain performance measures is graphically illustrated in Figure 4.11. From an Information Governance perspective, there are at least 5 indicators of IT business value:

(P1) *IT Investments*: Financial and non-financial business investments in IT, e.g., IT investments/employee, IT and Marketing investments for E-commerce;

(P2) *IT Operations*: Effectiveness and efficiency of internal work processes, and IT infrastructure - network - availability and reliability;

(P3) *IT Delivery*: Cost and time to implementation; business support and responsiveness to business needs

(P4) *Business Impact*: Changes and improvements in (a) business structure (e.g., coordination), (b) business processes (e.g., time-to-market), (c) business products (e.g., product bundling), (d) business services (e.g., customer satisfaction);

(P5) *Business Value*: Revenue growth, Market share, Profitability, Shareholder value.

Business-IT investments **(P1)** and business value **(P5)** depict the micro-economic 'input/output' paradigm of IT business value. These measures are linked to, and are part of IT and business sub-environments. Within the organization, however, several intermediate performance measures are included depicting a web of intermediate level contributions, including IT Operations **(P2)**, IT Delivery **(P3)** and Business Impact **(P4).** Collectively, these performance measures describe an organizational model of IT business value from an Information Governance perspective. The organizational model recognizes the time - lag - dimension in business value appropriation of IT, and the influential role and responsibility of both IT and business management in realizing business value from IT.

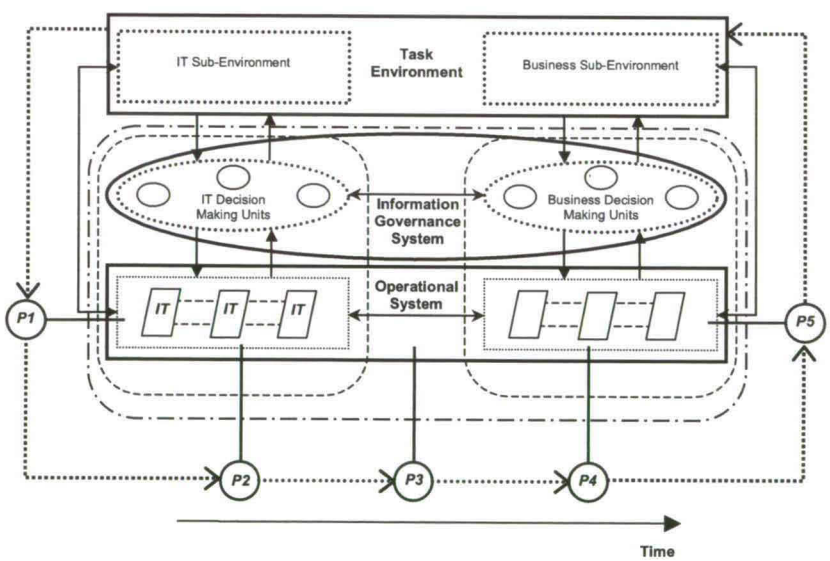

Figure 4.11. IT Business Value Chain: An Information Governance perspective

The dependent construct used in this study is the business value appropriation of IT. Therefore, the primary indicators used are Business Impact (P4) and Business Value (P5). However, due to (a) the lag-factor and (b) the interrelatedness of the indicators in the IT business value chain, IT Delivery (P3) and IT Operations (P2) are used as secondary indicators for assessing the business value appropriation of IT. Consistent with Weill & Broadbent (1998), a positive impact on all four levels is characterized as high IT business value.

4.6 Conceptual Framework for Information Governance

In Chapter 2, the general contingency model underlying much of the previous research on Information Governance was presented (Figure 4.12). The main thrust of this research model focused on the relationship between the organizational context and the locus of decision-making for IT, i.e., centralization and/or decentralization of decision-making for IT. In Chapter 2 and in the foregoing sections of this chapter (Chapter 4), several assumptions and limitations of this research model were addressed. Consequently, this research model was expanded in several ways for the purposes of this study.

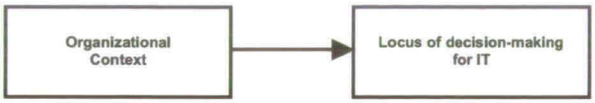

Figure 4.12. General research model in previous studies on Information Governance (see also Section 2.4).

First of all, based on previous studies and this study's selection of companies in a single industry, a specific aspect of the organizational context, i.e., the strategic context, was chosen as the independent construct. The strategic context is defined by the multiplicity and uncertainty of the organization's value sets and goals. Furthermore, it was stated that goal diversity in the strategic context leads to the creation of a hybrid system of interdependent - centralized and decentralized - decision-making units, in which corporate IT management, IT management and business management are involved (see Section 4.4.1). Specifically, the following proposition was formulated:

Proposition 1:
Goal diversity is associated with a hybrid decision-making system for IT, involving both centralized and decentralized decision-making units.

(Based on: Daft, 1998; Galbraith, 1994; Gresov & Drazin, 1997; Mintzberg, 1979; Hitt et al., 1998; Tushman & O'Reilly, 1998; Brown & Magill, 1998; Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998)

Next, following the conclusion that (a) selective decentralization, and subsequently, decision-making interdependencies and goal differentiation, and (b) goal uncertainty in the strategic context pose greater information processing requirements on the Information Governance system, and thus (c) require greater information processing capabilities, the following propositions were formulated (see Sections 4.4.2, 4.4.3, and 4.4.5):

Proposition 2:
Selective decentralization of Information Governance is associated with the use of (supplementary) horizontal coordination mechanisms.

(Based on: March & Simon, 1958; Lorsch & Lawrence, 1970; Daft, 1998; Galbraith, 1973,1994; Gresov & Drazin, 1997; Mintzberg, 1979; Brown & Magill, 1998; Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998; Parker et al., 1997; DeSanctis & Jackson, 1994)

Proposition 3:
Goal uncertainty in the strategic context is associated with the use of (supplementary) horizontal coordination mechanisms.

(Based on: March & Simon, 1958; March, 1988; Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970; Daft & Lengel, 1986; Daft, 1998; Galbraith, 1973, 1994; Tushman & Nadler, 1978; Gresov & Drazin, 1997; Mintzberg, 1979; Brown & Magill, 1998; Weill & Broadbent, 1998)

These propositions are an extension of the original general research model on Information Governance. Subsequently, a layered portfolio of structural, process and collaborative integration mechanisms was described (see Section 4.5.1), and the following proposition was formulated:

Proposition 4:
Higher levels of IT-decision-making differentiation require higher levels of IT-decision-making integration in order to realize high IT business value.

(Based on: Lawrence & Lorsch, 1967, 1969; Daft & Lengel, 1986; Tushman & Nadler, 1978; Ellinger et al., 1999; Galbraith, 1994; Griffin & Hauser, 1996; Gupta et al., 1986; John & Rue, 1991; Kahn, 1996; Kahn & McDonough, 1997; Kahn & Mentzer, 1998; Olson et al., 1995; Powell, 1992; Song et al., 1993; Henderson, 1990; Parker et al., 1997; Weill & Broadbent, 1998)

The foregoing propositions collectively lead to the following extension of the original research model employed in previous studies (Figure 4.13).

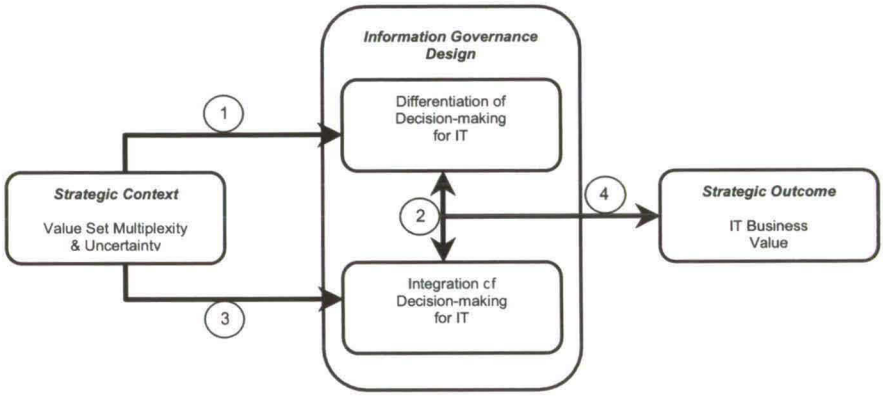

Figure 4.13. Conceptual framework for Information Governance.

However, several studies (see Section 2.6) describe the federal model for Information Governance as a necessary and sufficient condition for reaping business benefits from IT. Robson (1997) states that the federal model is now the norm. Von Simson (1990) states that the federal model is the best model, 'capturing the best of both - centralized and decentralized - worlds'. Rockart et al. (1996) describe the federal model as one the fundamental imperatives of IT in the late 1990s, and urge organizations to adopt the federal model, regardless of organizational contingencies. Earl (2000) argues that every company needs to build a degree of IT federalism. Already forecasted by Zmud et al. (1986), different studies indicate that this federal model is the dominant Information Governance practice in contemporary organizations (Feeny et al., 1989; Hodgkinson, 1996; Sambamurthy & Zmud, 1999). These studies suggest the following rival proposition (Figure 4.14; see also Section 3.3):

Rival Proposition:
High IT business value is associated with a hybrid configuration for Information Governance, regardless of the level of integration of decision-making for IT.

(Based on: Earl, 2000; Robson, 1997; Rockart et al., 1996; Von Simson, 1990)

Support for this proposition, would refute the other propositions, and therefore invalidate the conceptual framework.

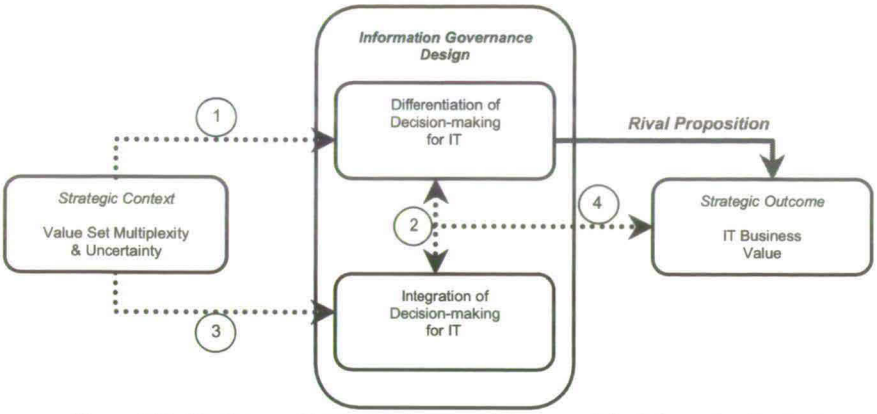

Figure 4.13. Rival proposition in the Conceptual Framework for Information Governance.

Chapter 5: Research Methods

Science, like all creative activity, is exploration, gambling, and adventure – Herbert Simon

5.1 Introduction

In the previous chapter, the theoretical background of this study was discussed, and the conceptual framework for Information Governance presented. In this chapter, the organization and research methods for data collection and analysis are described. An overview of the research flow is graphically depicted in Figure 5.1. Following the literature review and conceptual model (Chapter 4), the operationalization and measurement of the theoretical constructs is described (Section 5.2). Based on the operationalization an interview protocol is developed and tested in a pilot case study (Section 5.3). The selection and the characteristics of the case studies are described in Section 5.4. Within each company, interviews were conducted with Business and IT executives. Based on these interviews and an analysis of company archives, the case studies were described, analyzed, reports were sent to each of the interviews for verification. Subsequently, the cases were analyzed for distinctive patterns, and the conceptual framework and underlying propositions were validated. The procedures for data collection and data analysis are discussed in Sections 5.5 and 5.6.

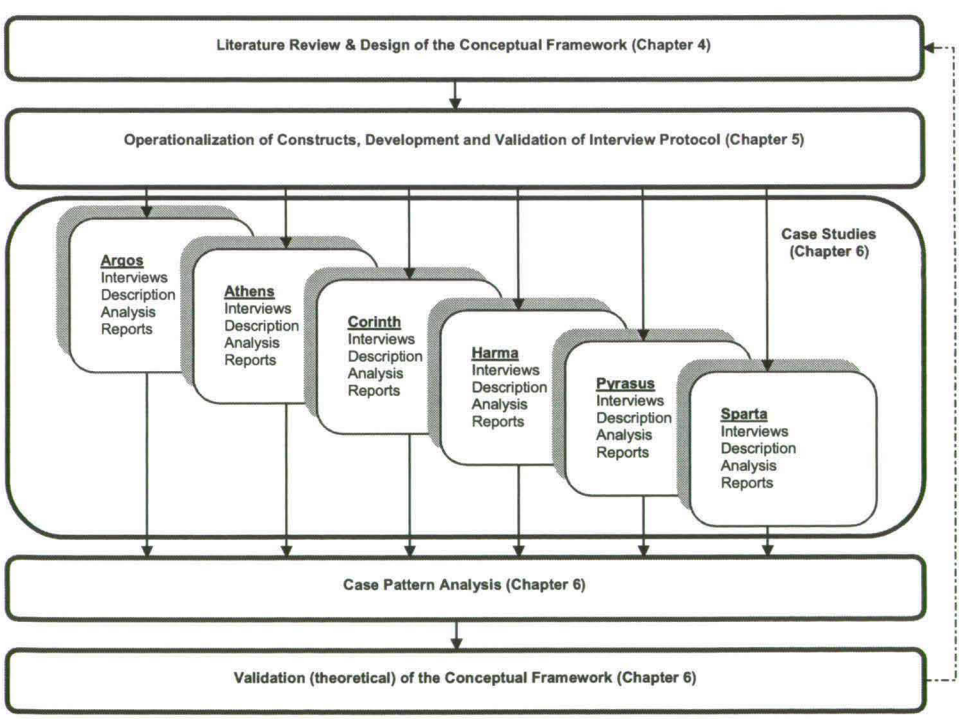

Figure 5.1. Organizational flow of the research.

5.2 Operationalization of the Theoretical Constructs

Empirical research requires the operationalization of theoretical constructs into indicators that are measurable, either qualitatively or quantitatively (Easterby-Smith et al., 1991). Following the conceptual framework, the main constructs in this study are:

(a) *Strategic Context*, describing the diversity and uncertainty of value sets (see Section 5.2.1);
(b) *Information Governance Design*, describing the differentiation and integration of decision-making for IT (see Section 5.2.2);
(c) *Strategic Outcome*, describing the business value appropriation from IT (see Section 5.2.3).

5.2.1 Operationalization of Strategic Context

Strategic context is defined as the diversity and uncertainty of value sets, and operationalized as (Table 5.1; see also Chapter 4, Section 4.3):

- *Operational excellence*, with business goals focused on: improving process efficiencies, streamlining work-flows, maintaining high productivity, ensuring reliable performance, avoiding risks, and minimize work disruptions;
- *Collaborative synergy*, with business goals focused on: sharing scarce information and knowledge resources, developing human resources, building cross-business partnerships, and attaining company wide synergies;
- *Complex innovation*, with business goals focused on: innovation in products, services and processes, acquiring innovative and advanced technologies, and strategic experimentation;
- *Customer value*, with business goals focused on: adaptability and responsiveness to new and unexpected market and customer demands, tailoring products and services to customer needs, and flexibility in taking on new tasks.

Table 5.1. Operationalization of the strategic context.

Goal Diversity **Goal Uncertainty**	Low → High			
(Diversity) **Value Sets**	Single Value Set (e.g., Operational Excellence)	Multiple non-competing value sets (e.g., Collaborative Synergy and Operational Excellence)	Multiple Competing Value Sets (e.g., Operational Excellence and Customer Value)	
(Uncertainty)	Operational Excellence	Collaborative Synergy	Complex Innovation	Customer Value

5.2.2 Operationalization of Information Governance Design

The differentiation of decision-making for IT is operationalized as the *actual* locus of decision-making for IT infrastructure, IT development, and IT applications (Table 5.2; see also Chapter 4, Section 4.4.1). The differentiation of decision-making for IT infrastructure, IT development, and IT applications describes 8 patterns with increasing differentiation from Pattern I (low) to Pattern VIII (high).

Table 5.2. Operationalization of differentiation of Information Governance design.

Patterns **Degree of Differentiation**	1 **LOW**	2	3	4	5	6	7	8 **HIGH**
IT Applications	DT	CM	DT	DB	CM	DB	DT	DB
IT Development	CM	DT	DT	CM	DB	DT	DB	DB
IT Infrastructure	CM	CM	CM	CM	CM	CM	CM	CM

CM = Centralized Corporate (IT) Management (Corporate level);
DT = Decentralized Division-IT management (LoB/SBU level);
DB = Decentralized Business-Division Management (LoB/SBU level).

The integration of decision-making for IT is operationalized as the use of structural, process, and collaborative integration mechanisms for integrating decision-making for IT (Table 5.3; see also Chapter 4, Section 4.4.3). Collectively, these integration mechanisms describe a multilevel framework of increasing integration capability ranging from low (structural integration) to high (collaborative integration). Individually, each type of mechanism ranges from low integration to high integration.

Whereas structural and process integration are measured in a direct manner, collaborative integration is indirectly assessed through the perception of business and IT stakeholders. For example, based on Reich & Benbasat (1996), shared understanding is assessed by asking business and IT executives what the key objectives of the business and IT organization are. Subsequently, the responses are cross-analyzed for congruency.

Table 5.3. Operationalization of integration mechanisms and integration capability.

INTEGRATION	MECHANISMS	CAPABILITY
Structural		**Low**
	Structural Integration: **LOW** ← Direct contact, Liaison, Task, Team, Committee, Integrating → **HIGH** Infrastructural Integration: **LOW** ←Communication Infrastructure, Location, Rewards, Rotation, Training → **HIGH**	↓
Process		
	Decision making comprehensiveness: **LOW** ← Non-Structured, Narrow, Non-formalized ; Structured, Inclusive, Formalized → **HIGH** Decision making integration: **LOW** ← Non, Administrative, Sequential, Reciprocal, Full → **HIGH** Conflict resolution: **LOW** ← Passive (Avoidance, Smoothing) ; Active (Competition, Confrontation) → **HIGH**	↓
Collaborative		**High**
	Stakeholder participation: **LOW** ← IT Management + Corporate IT Management + Business Management + Corporate Business Management → **HIGH** Shared Understanding: **LOW**: IT Management is not able to identify and explain key business objectives **and** Business management is not able to identify and explain key IT objectives **MODERATE**: IT Management is able to identify, but not explain key business objectives **and** Business management is able to identify, but not explain key IT objectives **HIGH**: IT Management is able to identify and explain the specific key business objectives **and** Business management is able to identify and explain specific key IT objectives	

5.2.3 Operationalization of Strategic Outcome

Strategic Outcome describes the business value appropriation from IT, and is operationalized as (a) the degree of goal achievement for IT Operations, IT Delivery, Business Impact, and Business Value, and (b) the level of business satisfaction with the contribution of IT to improved business performance (Table 5.4; see also Chapter 4, Section 4.5.2). Specifically, the following variables are used:

- *IT Operations*: IT infrastructure - network - availability and reliability;
- *IT Delivery*: Business support, and cost/time to implementation;

- *Business Impact*[40]: Improvements in coordination (business structure), cost-efficiencies, time-to-market (business processes), product innovation (business products), customer services (business services);
- *Business Value*: Revenue growth;
- *Business Satisfaction*: Business executive satisfaction with the contribution of IT to business performance.

Table 5.4. Operationalization of the strategic outcome.

IT Business Value	Indicators	Variables	Interpretation
Goal achievement for:	IT Operations	Availability Reliability	Low
	IT Delivery	Delivery costs Delivery time Business Responsiveness	
	Business Impact	Process improvements Structure improvements Product improvements Service improvements	
	Business Value	Growth Premium Income	High
Business satisfaction with:	IT contribution to improved business performance	Grade: (Low) 0 ←→ 10 (High)	

5.3 Pilot Case Study: Protocol Validation

Based on the operationalizations of the theoretical constructs, an interview protocol was developed (see Appendix I). An interview protocol is not an interview questionnaire, i.e., it does not explicitly contain questions to be asked in a prespecified format. Rather, an interview protocol is a 'guide' with a list of topics or items (informed by the operationalization of the theoretical constructs) that the researcher wants to explore during multiple interviews (Easterby-Smith et al., 1991). Interview protocols are particularly well suited for semi-structured interviews, in which the interviewer is free to probe and explore new issues as they arise during the interview. An interview protocol provides structure and flexibility, and improves the reliability of the research (Yin, 1994).

The operationalization of the constructs needs to be comprehensible and meaningful to the respondents (Easterby-Smith et al., 1991). Therefore, a pilot case study was conducted. A pilot case study is used to formatively address the content and procedures of the research (Yin, 1994), e.g., the in-/exclusion of items and/or the wording of questions. A pilot case study is not a pre-test, i.e., the validity of the conceptual framework is not assessed. Pilot case studies provide insight into the basic issues being studied, and assist in problem-structuring and problem-solution stages of the research.

The pilot case study was conducted in an Insurance company. Interviews were conducted with senior business and IT managers, and divisional business and IT managers. In total, 5 interviews were conducted. The Insurance company operates in both Life and Non-Life (P&C) Insurance markets, and is organized into several (strategic) business units. The IT organization consists of a central IT office responsible for corporate IT strategy, architecture and infrastructure, and various divisional IT managers, that have dual reporting responsibility to business division managers and the corporate IT office, which is led by an IT director. Business division managers are responsible for decision-making with regard to IT applications and IT development, whereas the corporate IT office takes charge of corporate IT affairs. IT managers play a supporting and linking role to both business management and corporate IT management. The Information Governance model can thus be described as a federal model. The informants also describe the use of several structural, process, and collaborative integration mechanisms (see also Appendix J for a summary of key answers).

Based on results of the interviews with business and IT informants, several indicators were changed in the operationalization of the theoretical constructs. In particular, all interviewees discussed the terminology of the strategic context, i.e., the operationalization of the value sets. Following the critique of several informants, the terminology of the value sets was changed. Specifically:

[40] Note that business improvements are related to the dominant value set(s) of the strategic context.

- Operational efficiency was rephrased to *operational excellence*;
- Collaborative capability was rephrased to *collaborative synergy*;
- Product innovation was rephrased to *complex innovation*;
- Market awareness was rephrased to *customer value*.

This terminology seemed to be more meaningful to, and representative of the practices and thoughts of corporate, business and IT managers in this company. In fact, this change in terminology is consistent with terms used by Treacy & Wiersema (1993) and Miller (1988). No other major problems were found in the operationalization and wording of the constructs.

5.4 Selection of Companies in Financial Services

As described in Chapter 3, this study is conducted in the Financial Service Industry (FSI) in the Netherlands. The choice for FSI is based on the information-intensive nature of products, services and processes, and the complex and dynamic nature of the business environment in financial services (see also Chapter 6, Section 6.2).

Six companies were selected in the Dutch FSI[41]. Five large financial conglomerates, active in both insurance and banking, currently dominate the market in the Netherlands. The case studies were conducted within this sample of large Financial Service Providers. The selected companies are large in size, employing over 2000 personnel. The selected organizations have multiple business divisions, each with profit responsibilities, and operate in related markets. Moreover, the organizations are characterized by a *federal model* for Information Governance. In all of the selected case studies, Information Governance is characterized by a differentiated decision-making system for IT. The organizations were thus purposefully, not randomly sampled.

The companies use different types of distribution channels, including, a bank network, an intermediary network, a tied agent network and the Internet (Table 5.5). Furthermore, over the past four years, each organization experienced growth in revenues, albeit at different growth rates (Figure 5.2). The average growth in revenues over a 4-year period is 60%, whereas the average percentage of IT investments of revenues is 6.5%.

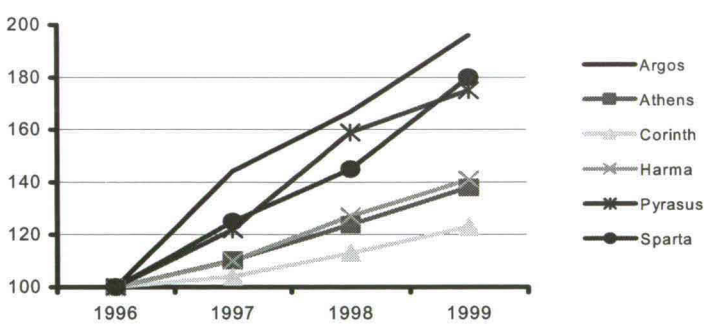

Figure 5.2. Revenue growth in the case study organizations.

Due to the sensitive nature of the data, confidentiality and anonymity of the company and the informants were assured to the participating companies. Consequently, no company-specific strategic/financial data was allowed to be published that could readily identify the company, and different aliases were used to label the case studies (Table 5.5).

[41] Ten companies were approached for this study. However, after a first meeting with the senior executives in these companies, four companies were dropped from the sample. Two companies did not meet the criteria of 'federalism', one company was in the midst of a large scale business transformation, and one company thought the questions addressed were too sensitive and 'highly political'. Anonymity and confidentiality were requested by these companies in exchange for their participation. Similar experiences have been reported by Lawrence & Lorsch (1967), Reich & Benbasat (1996), and Weill & Olson (1989).

Following Lawrence & Lorsch (1967; 1969), percentages were used to categorize the companies. Based on annual reports and internal business documents, the percentage in revenue growth on a year-to-year base was calculated. Considering the base-year - 1996 - as 100, the percentage in growth was calculated for each year, covering a total of 4 years. Lawrence & Lorsch (1967; 1969) indicate that revenue growth, measured over an extended period of time within the same industry, is an acceptable proxy measure of an organization coping effectively with its environment. Based on the growth percentages, Lawrence & Lorsch (1967; 1969) ranked the companies on the level of performance.

Table 5.5. Case Study Demographics.

Case Study	Alias	Distribution Channels	% Revenue Growth (1996 – 1999)	% IT Investment of Revenue (1998)
1	Argos	Bank network – Internet	> 60	< 6.5
2	Athens	Bank network – Internet	< 60	< 6.5
3	Corinth	Tied agent network – Internet	< 60	< 6.5
4	Harma	Intermediary network – Internet	< 60	> 6.5
5	Pyrasus	Bank network – Internet	> 60	< 6.5
6	Sparta	Bank network – Internet	> 60	> 6.5

5.5 Data Collection

The data collection process was undertaken over an 18 month period (1999-2000), and was divided in five phases: (1) on-site interviews and document collection, (2) interview transcription (3) feedback on interview reports, (3) verification of case report, and (4) company presentation and discussion of research findings.

On-site interviews were conducted with corporate and division stakeholders, representing business and IT management (see Table 5.6). Interviews were conducted according to the interview protocol. Each interview lasted approximately two hours, and was tape-recorded and transcribed. In total, 43 interviews were conducted with corporate business and IT executives, and business and IT division managers. All questions were purposefully addressed to business and IT respondents in order to assess convergent and internal validity (Yin, 1994).

Table 5.6. Primary sources of data collection.

Data Collection / Topics	Business Exec. Interview	IT Exec. Interview	Bus. Mgmt. Interview	IT Mgmt. Interview	Public reports	Company reports
Strategic Context	X	X	X	X	X	X
Information Governance Differentiation	X	X	X	X		X
Information Governance Integration	X	X	X	X		X
IT performance	X	X	X	X		X
Business performance	X	X	X	X	X	X

Besides interviews, internal documents and external reports were collected, covering the period 1996 - 2000. Internal documents included executive notes, meeting notes, business plans, IT plans, IT investment procedures, and project manuals and IT audits. Special permission was obtained for gathering and analyzing confidential documents. External reports included annual reports, organization charts, and business press reports. Besides the recollection of respondents, the collection of written documents allowed for a retrospective analysis of Information Governance developments. Based on interviews and documents, detailed case descriptions were reported to participants, requesting feedback and verification. All audio and written data was stored in a case study database.

From a case study methodology perspective, the use of (a) a theoretically-grounded framework, (b) a semi-structured interview protocol, (c) multiple key informants, (d) multiple data sources, and (e) the use of a case study database, improve construct validity, internal validity, and reliability (Easterby-Smith et al., 1991; Eisenhardt, 1989; Yin, 1994).

5.6 Qualitative Data Analysis

In contrast to quantitative data analysis, where numbers are 'crunched', qualitative data - text - analysis probes for deeper understanding of socially-complex phenomena in context-specific settings. Qualitative Data Analysis (QDA) incorporates expressive language and the presence of 'voice in the text', and there is no statistical test of significance to determine whether results 'count' (Miles & Huberman, 1984). The management and analysis of qualitative data is often structured into five distinct phases (Eisenhardt, 1989; Huberman & Miles, 1984; Ragin, 1999; Strauss & Corbin, 1990, Yin, 1994): (1) Organizing, (2) Coding, (3) Clustering, (4) Pattern analysis, and (5) Validation.

Organizing is the first phase in QDA and describes the sorting of the content into themes or subsections. These themes generally reflect the conceptual framework, and describe the theoretical constructs and dimensions of the empirical study. In this study, the key theoretical constructs are (a) the strategic context - value sets -, (b) the design - differentiation and integration - of Information Governance, and (c) the strategic outcome - IT business value. Each case report was structured and written-up according to these themes.

Coding describes the process of breaking down, examining, comparing, conceptualizing and categorizing data[42]. Coding is the necessary prerequisite for a systematic analysis of qualitative data. A code is a keyword or symbol applied to a segment of words in order to classify the words. Codes represent the operationalization of theoretical constructs, i.e., theoretical categories. A code scheme developed from theoretical constructs is referred to as a coding paradigm (Strauss & Corbin, 1990). The process of coding is the preliminary analysis in which the researcher interprets the data in order to construct meaningful explanations by exploring for patterns of facts in building a logical chain of evidence. Coding is essential to systemized within-case study analysis.

The codes used in this study are based on the operationalization of the theoretical constructs (see Section 5.2; Tables 5.1, 5.2, 5.3 and 5.4). Subsequently, a code scheme was devised to aid in the systematic coding of the case study descriptions. For example, when an interviewee states that an IT *steering committee* is used to manage IT infrastructure projects, and that e-business investments are assessed by an e-business *executive council*, the operative code is 'committee'. In another example, when an interviewee describes the dominant business goals in terms of improving process efficiencies, streamlining work-flows, and ensuring performance consistency, the operative code is 'operational excellence'. Applying a coding paradigm provides an Information Governance profile for each of the case studies, describing the strategic context, design and strategic outcome of Information Governance for each company. Each Information Governance profile was recorded in an electronic case study database.

Clustering is the first step towards cross-case analysis, and describes the clustering of single case studies into case clusters that share specific commonalities. Identifying cross-case commonalities provides the basis for constructing a general account of how the outcome comes about. In multiple case study, the purpose of clustering is to relate variability in outcomes, to constants in processes. In this study, the case studies were grouped based on an analysis of the strategic outcome, i.e., the level of IT business value (see Section 5.2; Table 5.4). Two clusters of cases were identified, i.e., (a) low performing, and (b) high performing organizations. Subsequently, pattern analyses were conducted within and across these two clusters of case studies.

Pattern analysis describes the systematic analysis of data patterns within and across - clusters of - cases. The objective of pattern analysis is to explore - process - similarities and differences within and across case studies that contrast in outcome. Data displays, including graphs, matrices and scatter-plots, provide an essential aid in pattern analysis (Miles & Huberman, 1984). Data displays are designed to

[42] Coding can be facilitated by using computer-based QDA programs (e.g., NUDIST, HyperRESEARCH, ATLAS/ti, AQUAD). However, whether one chooses to use a computer program or not, it is the researcher who defines and names the categories of data (Strauss & Corbin, 1990). In this study, no use was made of a computer-based QDA program.

assemble organized qualitative data in an immediately accessible, compact form, so that the researcher can explore what is happening, and draw explanations.

Scatter-plots are figures that display data on two or more dimensions of interest that are related to one another. Data from the case studies are graphically depicted in a space formed by the respective axes, so that some determination of similarity and contrast between the case studies can be made. The use and importance of scatter-plots for QDA is acknowledged in organization studies and IS research (see, e.g., Daft & Lengel, 1984; Lawrence & Lorsch, 1967; Reich & Benbasat, 1996). Lawrence & Lorsch (1967; 1969) used a relatively simple scatter-plot to analyze the relationships between differentiation, integration and performance in their study of six companies in the - dynamic and complex - Plastics Industry (Figure 5.3).

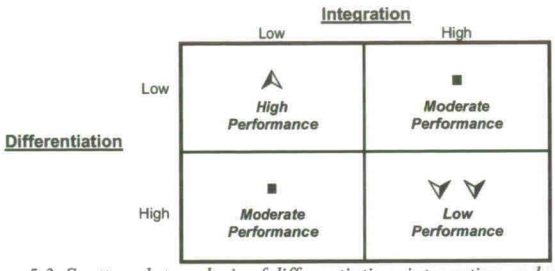

Figure 5.3. Scatter-plot analysis of differentiation, integration and performance (Adapted from Lawrence & Lorsch, 1967).

In this study, matrices and scatter-plots are used to systematically describe and analyze patterns of similarities and differences with and across the cases. Matrices are used to categorize and cluster the individual case studies. Scatter-plots are used to analyze patterns and associations between the theoretical constructs within and across the case studies. A similar scatter-plot to that of Lawrence & Lorsch (1967) is used to analyze the relationships between the design of Information Governance and IT business value.

Validation is the final stage in QDA and describes the comparison and verification of the theoretical propositions with the empirically-derived evidence and patterns. If the patterns coincide, the results strengthen the (internal) validity of the conceptual framework. Validation is essential to analytical generalization or extrapolation, i.e., the process by which the researcher draws conclusions about the essential linkage between two or more characteristics in terms of a systematic explanatory scheme, i.e., a set of theoretical propositions (Smith, 1990). In order to validate the conceptual framework, the empirically-derived patterns within and across the case studies are compared to the theoretical propositions formulated in Chapter 4 (see Section 4.6). The findings are analyzed against the explanations offered by the conceptual framework and underlying propositions, and discussed in light of previous - organization and IS - studies.

5.7 Conclusion

In conclusion, this chapter described the organization of the research, and the operationalization of the theoretical constructs. Furthermore, the research instruments and techniques for data collection and data analysis were discussed. In the previous section, the different stages of qualitative data analysis were presented. Table 5.7 summarizes the different research phases and the tactics used to meet the research quality criteria *for case study research* (see also Yin, 1994; Eisenhardt, 1989).

In the following chapter (Chapter 6), the case studies are described and analyzed. Following the analysis and results of the case studies, the conceptual framework and underlying propositions are discussed.

Table 5.7. Research tactics applied in addressing research quality criteria.

Research Phase	Tactic	Research Criteria
Design Conceptual Framework	Develop 'a-priori' framework grounded in organization theory	Construct Validity
Operationalize Constructs	Operationalization used in previous studies	Construct validity
Test Interview Protocol	Use of standard interview protocol	Face validity Reliability
Collect Case Study Data	Develop case study database Multiple sources of evidence Multiple business and IT respondents Verification by respondents	Reliability Internal validity
Analyze Case Study Data	Organizing, Coding, Clustering, Pattern analysis, Validation	Internal validity

Chapter 6: Information Governance in Financial Services

Our problems are man-made, therefore they may be solved by man – John F. Kennedy

6.1 Introduction

In chapter 4, the conceptual framework of this study was described. In chapter 5, the research methods and the case study demographics were presented. Based on the conceptual framework, and following the research methods, this chapter presents a description and analysis of the case studies on Information Governance in Financial Services. The remainder of this chapter is structured as follows. To provide a context to the case studies, business and IT developments in the Financial Services Industry are briefly described in Section 6.2. In Section 6.3, the case studies are described. The analysis of the case studies is presented in Section 6.4. In Section 6.5, the case study results are discussed in light of the conceptual framework and the propositions. This chapter concludes with a discussion of the support for the conceptual framework in Section 6.6.

6.2 Financial Services & Information Technology

Financial Services have played an important role in the economy since the beginning of recorded history. A medium of exchange existed among the most ancient societies. The Babylonians insured ships in 3000 BC, and the Greeks introduced coins to the West in 625 BC. The Flemish financed wars and trading as far back as the 11th Century (Hamlyn, 1963). With the advent of the Industrial Revolution, the Financial Services Industry grew in scope and complexity. The increasing need for large-scale investments that accompanied industrialization created a demand for larger and more sophisticated financial institutions. Many of the standard products of banking and insurance business were developed during this period. In the 20th Century, the rise of mass consumer societies engendered further development of the Financial Services Industry. New products - e.g., credit cards - and new types of financial institutions - e.g., retail securities brokers - were introduced.

As the 21st Century dawns, the Financial Services Industry continues to experience significant change. However, contrary to the focus in previous decades on mass production and local price competition, many Financial Institutions, including banks and insurance companies, are currently concentrating on providing value-added services through global and pan-European networks (Peterson, 2001). Over the past decade, the strategic focus in the Dutch Financial Service Industry has indeed shifted from price to service quality. Heightened customer expectations and service customization have made service quality essential to an organization's success in the Financial Services Industry (Frei et al., 1999; Krishnan et al., 1999). In fact, it is reported that 70% of the defection of customers in the Financial Services Industry is caused by dissatisfaction with the quality of services delivered (Bowen et al., 1993; Karimi et al., 2001).

The increasing and mutually reinforcing developments in (a) financial innovation, (b) customization, (c) deregulation, (d) globalization, and (e) the application of Information and Communication Technologies have caused significant change in the markets and organization of Dutch Financial Institutions. Financial innovation and customization consist of new combinations - bundling and

unbundling - of financial services, products and activities to achieve economies of scale and scope, and add value by meeting new customers needs (Dietrich, 1996). This involves being able to offer a comprehensive range of products and services at a competitive price, and the flexibility to accommodate non-standard requirements and new financial instruments in an effective and timely manner. Deregulation has enabled traditional financial and non-financial service organizations to increase the range of financial services and products they provide. The provision of insurance policies through banking - *bancassurance* or *AllFinanz* - illustrates the impact of deregulation, and the breakdown of organizational barriers between banking and insurance, and their replacement by integrated Financial Institutions offering a range of services. Deregulation has also encouraged the entry of new participants in financial services, specializing in one or more financial activities. With the globalization of financial services, organizations also increase their reach for providing services and products across geographically outlined borders, thus exploiting new Global and pan-European market opportunities (Hayes, 1993). Studies indicate that the concert of these developments has increased the level of competition in the Dutch Financial Services (Peterson, 2001).

The competitive and information-intensive environments of Financial Services make the rapid advancements in IT one of the basic drivers of change (Fincham et al., 1994; Freedman & Goodlet, 1998; White, 1998). IT is often regarded as a competitive necessity given the strategic and dependent role in Financial Services (Dietrich, 1996; McFarlan, 1984; Porter & Millar, 1985; Wiseman, 1985). The differentiation of service quality and the introduction of new products and services through IT investments have become strategic tools. IT is suggested to have a strategic role because (a) IT is one of the primary means for the delivery of products and services, (b) the infrastructure of the business is often IT itself, and (c) each organization's IT infrastructure is a major component of its asset base (Weill & Broadbent, 1998; Karimi et al., 2001)

Furthermore, the advancements and availability of IT have enabled innovation, customization, deregulation, globalization and the broader transformation of financial services (Fair & Boissieu, 1990; Hayes, 1993; Freedman & Goodlet, 1998). The rapid commercialization and improved communication capabilities of IT have allowed for (a) the bundling and unbundling of financial activities, (b) the development and delivery of sophisticated financial products to meet growing and specific customer demands, (c) the differentiation and integration of delivery channels, and (d) the integration of financial services across organizational and geographic boundaries (Dietrich, 1996). This has enabled the Dutch and pan-European Financial Services Industry to vastly expand the level and extent of its services, including 'B2B' and 'B2C' e-banking. According to a recent survey by IDC and the Financial Times, 'e-banking' is expected to grow in the years to come (Figure 6.1). The survey also indicates, however, that while banks show keen interest in e-markets and e-banking, currently the potential far exceeds reality (Financial Times, 2001).

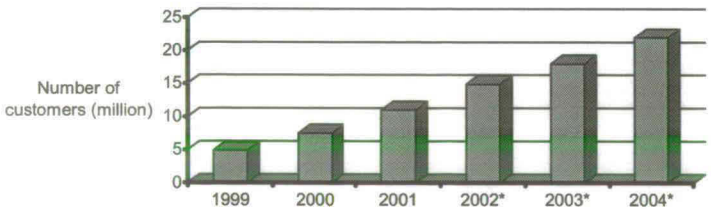

Figure 6.1. Expected growth in Pan-European electronic banking.

The Dutch Financial Services Industry accounts for 5.5% of the Gross Domestic Product, and approximately 13% of all IT expenditures in the Netherlands (CBS, 2001). The Netherlands ranks 8th in world-wide IT spending, accounting for 1.8% of world-wide IT expenditures. The US leads world-wide IT spending with 41.8%, followed by Japan (13.3%), Germany (7.2%), the UK (6.4%), France (5.4%), Canada (3.0%), and Italy (2.3%) (WITSA, 2000). More than half of IT expenditures in the Dutch Financial Services Industry are spent on IT services. Hardware and software technology expenditures account for 38%, whereas 62% is spent on IT services.

Regarding network-intensity in Financial Institutions, 95% of all PCs and terminals are interconnected through an (internal) electronic network (CBS, 2001). A recent study by the Central Bureau of Statistics (CBS, 2001) indicates that (external) electronic networks, including the Internet, are used for:

(a) General communication, e.g., e-mail; (b) Presenting 'on-line' company information, e.g., company homepage; (c) Financial transactions; (d) Procurement; (e) Human Resource Management/Knowledge Management; (f) Customer services; (g) Communication with government agencies (Figure 6.2).

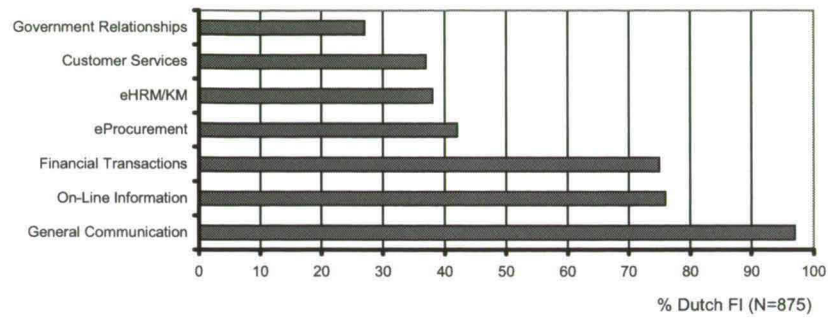

Figure 6.2. Use of electronic networks by Dutch Financial Institutions (CBS, 2001).

6.3 Case Study Descriptions

Whereas, the previous section provided a general background of several developments in the Financial Services Industry, this section provides a description of the six case studies conducted in the Dutch Financial Services Industry. The strategic context, the design and strategic outcome of Information Governance is described for each of the cases. Specifically, Section 6.3.1 describes the case of Argos; Section 6.3.2 describes the case of Athens; Section 6.3.3 describes the case of Corinth; Section 6.3.4 describes the case of Harma; Section 6.3.5 describes the case of Pyrasus; Section 6.3.6 describes the case of Sparta.

6.3.1 The Case of Argos

The primary value proposition in Argos is customer value, focusing on the customization of products and services, building customer loyalty, and understanding and satisfying the specific needs of customers. Customer satisfaction is measured regularly by Argos. The strategic context of Argos is also characterized by key business objectives describing product innovation, improving cost-efficiencies and cycle times, and streamlining (cross-business) workflows.

Decision-making for IT is differentiated across corporate IT management and business management. Corporate IT management is responsible for, and makes strategic decisions regarding IT infrastructure. Business management is responsible for, and makes strategic decisions regarding IT development and divisional IT applications. Corporate business management and divisional IT management play an important role in assisting both corporate IT management and business management in decision-making regarding IT infrastructure, IT development and IT applications.

Different integration mechanisms are used in Argos. Structural integration mechanisms include various personal and electronically-facilitated contacts between key stakeholders, steering committees, project teams, and task forces. Cross-training of business and IT management, job rotation and co-location are likewise structural integration mechanisms employed in Argos. Process integration mechanisms in Argos describe a formalized processes of strategic decision-making, in which the integration of business and IT decisions is explicitly addressed. Business decisions influence IT decisions, and IT decisions influence business decisions. Often, these decisions and their implications are considered jointly by both business and IT managers. The decision-making process at Argos describes a comprehensive process of defining business objectives for IT decisions, and selecting the best decision for achieving the business objective. Strategic monitoring of IT initiatives is likewise a standard and formalized practice in Argos. Moreover, a management forum exists in which business and IT management discuss problems and opportunities, negotiate solutions, and attempt to resolve conflicts.

Corporate management, corporate IT management, business division management and IT management are actively involved throughout the different stages in decision-making for IT, and share the perception that IT is an enabling factor for transforming the business. Whereas business and IT management have their own concerns and objectives, i.e., business management is focused on the interaction with customers, and understanding the customer needs, IT management is focused on providing reliable and efficient IT operations and IT services. IT management is aware of the importance of these processes for achieving the business objectives, while business management is cognizant of the critical dependency on IT, and the objectives of IT management to improve IT operations and IT delivery.

With regard to the performance achievements of IT operations and IT delivery, business and IT management indicate that availability and responsiveness have improved over the past years, and are considered to be very good. According to IT management, in most cases, system development projects are finished on time and within budget. Business management states that IT projects very often meet all of the business requirements, and systems are fully functional. Corporate and business management indicate that IT has enabled numerous changes and improvements in the organization, including, shared business information architecture, increased time-to-market and flexibility; innovation in products and distribution channels, and improved customer satisfaction. Stakeholders are very satisfied with the business value appropriation from IT.

6.3.2 The Case of Athens

Athens distributes its products and services through banking channels. The primary value propositions in Athens are product leadership (complex innovation), followed by operational excellence. Strategic business objectives include rapid commercialization, improving time-to-market, reducing cycle times, and optimizing business process and reducing transaction costs. Collaborative synergy and customer value are also regarded as important secondary value propositions, recognized in business objectives of customer responsiveness, customer convenience, and the search for functional and business unit collaborations.

Decision-making for IT is differentiated across corporate IT management and divisional IT management. Corporate IT management is responsible for, and makes strategic decisions regarding IT infrastructure. Divisional IT management is responsible for, and makes strategic decisions regarding IT development and divisional IT applications. Corporate management and business management are occasionally involved in decisions regarding IT. Officially, business management is responsible for decision-making regarding IT development. In practice, however, IT management makes decisions regarding IT development.

Structural integration mechanisms used in Athens include various personal direct contacts between key stakeholders, steering committees, and project teams. Co-location of IT and business management in projects teams is sometimes also used. Process integration mechanisms in Athens describe an ad-hoc processes of strategic decision-making in which the integration of business and IT decisions are not always addressed. IT decisions are often administratively integrated with business decisions, i.e., budgets are assigned and resources are allocated. According to IT management, decision-making for IT describes a process of making IT decisions based on vague business objectives, and selecting a solution that is not really understood by the business. Strategic monitoring of IT initiatives is almost never done. Business management indicates that conflicts that arise during decision-making are hardly ever resolved, and that corporate IT management often dictates what needs to be done.

Only corporate IT management and divisional IT management are actively involved in making IT decisions. Whereas IT management holds a dependent perspective of the role of IT in the organization, business management states that IT should be used to enable business change and improve product and service innovation. The different goal-orientations of business and IT management reflect the dual value propositions for product leadership and operational excellence. Whereas business and IT management have their own concerns and objectives, i.e., business management objectives are geared towards product development and rapid commercialization, and IT management objectives are focused on operational efficiencies and reducing transaction costs.

With regard to the performance achievements of IT operations and IT delivery, business management is dissatisfied with the low functionality of antiquated systems, and lack of responsiveness by the IT

organization. According to business management, IT developments take too long, and almost never meet the stated business requirements. IT management state that it is never clear what business management exactly want. Business objectives regarding product and service innovation, improved time-to-market, and customization of services go largely unfulfilled according to business management. Stakeholders are largely dissatisfied with the business value appropriation from IT.

6.3.3 The Case of Corinth

Corinth utilizes a network of tied agents for the distribution of its products. All insurance products and services are sold from its internal offices through its own sales force. The dominant value propositions in Corinth are operational excellence, followed by customer value. Strategic business objectives include reducing transaction costs, improving productivity and cost-efficiencies, understanding the specific needs of customers, and tailoring products and services to the specific needs of customers.

Decision-making for IT is differentiated across corporate IT management and divisional IT management. Corporate IT management is responsible for, and makes strategic decisions regarding IT infrastructure and IT development. Divisional IT management is responsible for, and makes strategic decisions regarding IT applications. Formally, business management is responsible for decision-making regarding IT development, but in practice IT management takes the leading role in IT development projects. Business management states that it is often unclear who should be making strategic decisions regarding IT.

Structural integration mechanisms used in Corinth include, personal contacts between business and IT management, and the use of steering committees and project teams. A shared project database has recently also been developed for managing IT projects and sharing best practices. Process integration mechanisms in Corinth describe an ad-hoc processes of strategic decision-making in which the integration of business and IT decisions is not always explicitly addressed. IT decisions are often administratively or sequentially integrated with business decisions, i.e., budgets are assigned and resources are allocated, and IT decisions are derived from business plans and business decisions. Business management characterizes decision-making for IT as a 'quick and dirty' process. Evaluation of IT initiatives is scarcely conducted. Conflicts that arise during decision-making are hardly ever resolved, and business management indicates that it is often a matter of 'who is the strongest'. Recently, however, in light of the dissatisfaction with IT decision-making processes, Corinth adopted a balanced scorecard approach for structuring and formalizing IT decision-making.

Corporate IT management and divisional IT management are actively involved in making IT decisions, while business management is occasionally involved, usually in defining business problems. Whereas IT management views IT as a utility supporting business processes, business management indicates that IT should play an enabling role in the organization. Business management states, however, that IT is currently more of an inhibitor than an enabler. Furthermore, according to business management commercial objectives remain unachieved. Many IT initiatives fail to meet time, cost and functional requirements. Furthermore, the IT architecture requires updating, but because of many other high priority projects, and the complexity of systems, systems quality and IT flexibility for developing new products is not possible, according to business management.

Business management indicates that they are extremely dissatisfied with the performance achievements of IT operations and IT delivery. The dissatisfaction is due to the low functionality of antiquated systems, and the lack of business responsiveness by the IT organization. Business management indicates that IT-based business developments almost never meet the stated business requirements, and the delivery time and costs always exceed the intended plans. Business objectives regarding product and service innovation, improved time-to-market, and customization of services go largely unfulfilled according to business management. On the other hand, IT management states that business management is not clear in their demands and needs.

6.3.4 The Case of Harma

Harma distributes its products through a network of independent intermediaries. The primary value propositions in Harma are operational excellence, followed by collaborative synergy. Strategic business objectives include optimizing business process and reducing transaction costs, streamlining cross-functional and business processes in order to share resources company-wide. Customer value and

product innovation (complex innovation) are also regarded as important secondary value propositions, recognized in business objectives of customer responsiveness, customer convenience, and improving time-to-market and cycles time reduction.

Decision-making for IT is differentiated across corporate IT management and divisional IT management. Corporate IT management is responsible for decision-making regarding IT infrastructure. Divisional IT management makes decisions regarding IT development and business IT applications. According to company documentation, however, business management is responsible for decision-making regarding new IT developments. Yet, in practice, IT management usually makes decisions regarding new IT developments. IT managers are also often appointed as project managers.

Structural integration in Harma involves various mechanisms, including, personal and electronically-facilitated contacts between key stakeholders, steering committees, project teams, account managers, and competence centers. Recently, two new integrating functions, i.e., IT Program Management and Information Management were designed to integrate business and IT decisions. Both functions report to the CIO. In large and complex projects, IT and business management are often co-located. Process integration mechanisms in Harma describe separate, ad-hoc strategic decision-making in which the integration of business and IT decisions was not always addressed. Recently, through the IT program management function, business and IT managers are attempting integrate business and IT decisions. A balanced scorecard/Information Economics method is used to identify business objectives, and evaluate and select alternatives. Furthermore, the IT program manager states that the balanced scorecard method will also be used to monitor IT initiatives.

This new formalized way of working is in stark contrast with previous practices in which IT decisions were often only administratively integrated with business decisions, i.e., budgets are assigned and resources are allocated. The program manager indicates that the traditional separation of business and IT decision-making has led to 'different parochial cultures' that exist with different interests and goals. IT management states. A senior IT management states that conflicts arise, and remain unresolved between business and IT management. Corporate IT management and divisional IT management are predominantly involved in making IT decisions. Occasionally, business management participate in decision-making, but IT management indicates that this is not the norm.

Senior executives and business management indicate that IT is more of an inhibitor than an enabler. Except for few individual successful projects, more than half of the IT initiatives fail to meet time, cost, quality, and functional requirements. Many IT projects still run over time and budgets limits, do not meet functional requirements or business objectives, and users are largely unsatisfied. An internal memo indicates that the Board of Directors is not satisfied with the performance of the IT systems. According to business management the real value for our business and customers, in the form of improved products and services, remains unrealized. A recent IT strategy plan states that Harma is not getting the expected value for money from investments made in IT. Senior business and IT, and divisional business managers remain largely unsatisfied.

6.3.5 The Case of Pyrasus

Pyrasus offers a complete range of personal and commercial insurance products through a branch network and call center of a bank. The primary value propositions in Pyrasus are product leadership (complex innovation), followed by operational excellence. The strategic objectives of the Pyrasus are to improve the effectiveness and efficiency of the different distribution channels, the commercialization of products, and the responsiveness to market developments and customers. Optimizing business processes and improvements in image are likewise key business objectives. The launch of new forms of insurance, linked to banking products, as well as the stronger focus on insurance in the branch network, have made a significant contribution to the growth of Pyrasus. Collaborative synergy and customer value are also regarded as important secondary value propositions, recognized in business objectives of customer responsiveness, customer convenience, the search for cross-business collaborations.

Decision-making for IT is differentiated across corporate IT management, business management and IT management. Corporate IT management is responsible for, and makes strategic decisions regarding IT infrastructure, including, IT operations, IT networks, and IT support. Business management is responsible for, and makes strategic decisions regarding local IT developments, while IT management

is primarily responsible for IT applications decisions. Company-wide, infrastructural IT developments are the decision-making responsibility of the corporate IT organization.

Different integration mechanisms are used in Pyrasus. Structural integration mechanisms include various personal and electronically-facilitated contacts between key stakeholders, steering committees, project teams, task forces, and account managers. Job rotation and co-location are likewise used. IT workshops are also organized to disseminate experiences and new practices regarding innovative management of IT. Process integration mechanisms in Pyrasus describe a formalized process of strategic decision-making, in which the integration of business and IT decisions is explicitly addressed. Business and IT decisions and their mutual implications are considered jointly by both business and IT managers. The decision-making process at Pyrasus describes a comprehensive process of defining business objectives for IT decisions, and selecting the best decision for achieving the business objective. The evaluation of IT projects and systems are likewise a standard and formalized practice in Pyrasus.

Corporate management, corporate IT management, business division management and IT management are actively involved throughout the different stages in decision-making for IT, and share the perception that IT is an enabling factor for transforming the business. Whereas business and IT management have their own concerns and objectives, i.e., business management is focused on the product and process innovation, IT management is focused on providing reliable and efficient IT operations and IT services. IT management is aware of the importance of these processes for achieving the business objectives, while business management is cognizant of the critical dependency on IT, and the objectives of IT management to improve IT operations and IT delivery.

Regarding the business value of IT, corporate and business management indicate that IT has enabled numerous changes and improvements in the organization, including, shared business information architecture, increased time-to-market, innovation in products and distribution channels, and improved customer satisfaction. Concerning IT operations and IT delivery, business and IT management indicate that availability of IT systems and the responsiveness of the IT organization is very good. According to IT management, system development projects are usually finished on time and within budget. Business management states that IT projects very often meet all of the business requirements. Business and IT stakeholders are satisfied with the business value appropriation from IT.

6.3.6 The Case of Sparta

Sparta is part of an internationally and domestically operating financial services organization, and provides both banking and insurance products through its network of interconnected branch offices. The corporate strategy of Sparta is to position itself as a provider of integrated banking and insurance products and services, and the creation of a broad range of insurance products linked to banking products. The main value propositions in Sparta are customer value, followed by operational excellence. Product and service innovation (complex innovation) and collaborative synergy are also mentioned as important strategic objectives. Sparta aims to supply a comprehensive and high-quality range of banking and insurance products. The focus is on the customer with their unique financial situation, wishes and requirements. Operational efficiency and effectiveness, product innovation, service quality, and added-value to the customer are strategic business objectives.

Decision-making for IT is differentiated across corporate IT management and business management. Corporate IT management is responsible for, and makes strategic decisions regarding IT infrastructure, including, IT operations, IT networks, and IT support. Business management is responsible for, and makes strategic decisions regarding business IT developments and business IT applications. Company-wide, infrastructural IT developments are the decision-making responsibility of the corporate IT organization. Corporate business management and divisional IT management play an important role in assisting both corporate IT management and business management in decision-making regarding IT infrastructure, IT development and IT applications.

Business portfolio committees, executive steering committees, an IT advisory group, project teams, relationship managers, a central project office, job-rotation, cross-functional training, Lotus Notes, Electronic Project Management tools are the structural integration mechanisms that Sparta uses. Sparta employs a standardized phased approach for IT decision-making, in which both business and IT management are involved. The phased approach for IT decision-making involves seven, formalized,

activities: (a) idea generation; (b) scanning; (c) proposal assessment; (d) project organization; (e) system development; (d) implementation; and (e) evaluation. These seven activities are driven by the business, and led by the business organization, with the involvement of IT management. IT vision workshops and business forums are used to discuss problems and highlight new ideas. According to business and IT management, conflicts are often resolved in these, more informal, settings.

IT performance in Sparta is assessed by looking at targets set for time, budget, functionality and quality. The realization of these targets is assessed on a yearly basis, based on the project evaluations that take place. In general, projects are finished on time, within budget, and systems are of high functionality and quality. Business management indicates that over 80% of the projects carried out meet functional and quality requirements. Business and IT managers identify the following contributions of IT arguing that without IT, these improvements and added-value would not have been possible: increased time-to-market and flexibility, improved product innovation; reduced transaction costs; sustained market growth; improved customer satisfaction; and improved business flexibility. Business and IT management state that they are very satisfied with the business value appropriation from IT.

6.4 Case Analyses

This section describes the coding, clustering and pattern-analysis of the case studies. Specifically, following the theoretical framework (Figure 6.3), the case studies are coded in a 'left-to-right' logic.

In Section 6.4.1, the strategic context of the case studies is coded. The coding of the differentiation and integration of Information Governance is described in Section 6.4.2. The strategic outcome is coded in Section 6.4.3. Subsequently, based on the coding of the strategic outcome, the case studies are clustered into groups of similar IT business value levels. In Section 6.4.4, patterns of similarities and differences - within and across - the case studies are discussed. In particular, patterns in the strategic context and the design of Information Governance are described. In terms of the conceptual framework, the pattern-analysis follows a 'right-to-left' logic (Figure 6.3). Scatter-plot diagrams are presented to aid in the analysis of the case studies.

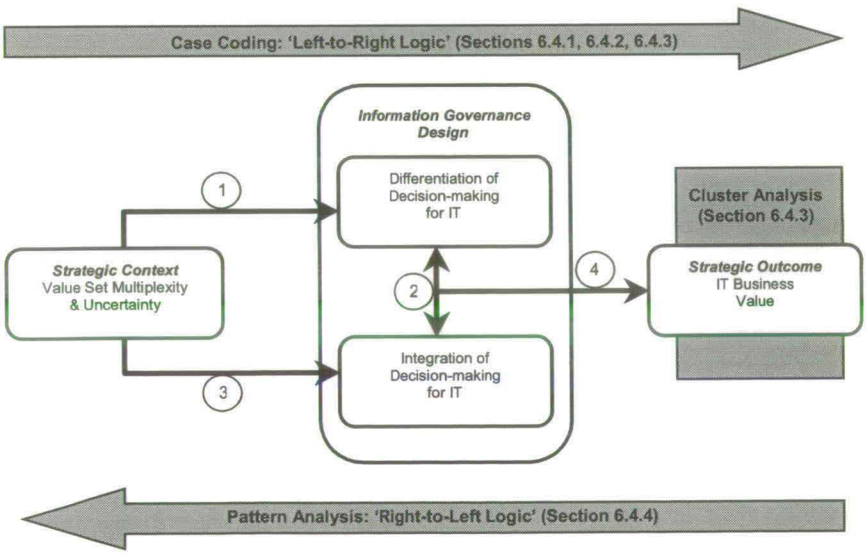

Figure 6.3. Coding, clustering and pattern analysis of the case studies.

6.4.1 Strategic Context: Value Set Multiplexity

Based on the case descriptions, Table 6.1 describes the analysis of the strategic context. Specifically, the analysis is focused on the level of goal diversity and goal uncertainty of the strategic context. The analysis indicates that the strategic context for each of the case studies is characterized by multiple value sets. In each of the cases, the strategic context describes a high degree of goal diversity and goal uncertainty (Table 6.1). Moreover, each case is characterized by a dominant (**) and supporting (*) value set. A dominant value proposition describes the main or primary focus of the company's competitive strategy, whereas a supporting value proposition describes a secondary - less dominant - focus of a company's competitive strategy. The distinction between dominant and secondary value propositions was made based on the interviews conducted in the case studies[43].

The dominant value set in *Argos* is customer value, followed by operational excellence and complex innovation. The dominant value set in *Athens* is complex innovation, followed by operational excellence and customer value. The dominant value set in *Corinth* is customer value, followed by operational excellence and collaborative synergy. The dominant value set in *Harma* is operational excellence, followed by customer value and collaborative synergy. The dominant value set in *Pyrasus* is complex innovation, followed by operational excellence and customer value. The dominant value set in *Sparta* is customer value, followed by operational excellence and collaborative synergy.

In summary:
- Customer value is a dominant value driver in Argos, Corinth, and Sparta;
- Complex innovation (product leadership, product/service innovation) is a dominant value proposition in Athens and Pyrasus;
- Operational excellence is the dominant value proposition in Harma;
- Collaborative synergy is not mentioned as a dominant value proposition in any of the cases, yet is consistently mentioned as an important supporting value proposition

The analysis indicates that these organizations are experiencing competing demands for continuously delivering customized, high quality products and services, and compressing costs and time in order to market products efficiently and quickly. As an Argos Business Manager describes:

> *"Traditionally, we focused on operational excellence and streamlining our business processes. I mean, cost-efficiencies have always been a top priority. However, over the past 2 or 3 years we have clearly shifted the focus towards the customer, thereby focusing on the needs and demands of our customers. This doesn't mean that we are no longer looking for cost-efficiencies; it means that we are also focused on pro-actively adding value to our customers".* – Argos Business Manager.

Table 6.1. Coding of the strategic context.

	Value Sets				Multiplexity	
Case Studies:	Operational Excellence	Collaborative Synergy	Complex Innovation	Customer Value	Goal Diversity	Goal Uncertainty
Argos	*	*	*	**	High	High
Athens	*	*	**	*	High	High
Corinth	*	*	*	**	High	High
Harma	**	*	*	*	High	High
Pyrasus	*	*	**	*	High	High
Sparta	*	*	*	**	High	High

[43] There was no prior theoretical or empirical precedence that led to this distinction. The distinction between dominant and secondary value propositions is based on the empirical data.

The analysis also indicates that IT is a competitive necessity, and an integral part of the value sets in these FSI:

> *"We have reached an optimum cost-quality level and a commodity market exists. We need to add customer value through product and service innovation; without IT this just isn't possible. For instance new distribution channels, such as the Internet, are used to cater to the needs of customers".* – Pyrasus Business Manager

> *"Without IT there is no innovation, no marketing, no added value for customers. Continued investments in IT are seen as critical for sustaining a competitive position".* – Sparta Senior Executive

6.4.2 Information Governance Design: Differentiation & Integration

The case studies reveal different patterns in the differentiation of IT decision-making (Table 6.2; see also Chapter 5). Argos and Sparta are characterized by a relatively high level of differentiation (Pattern 8), in which corporate IT management (CM) makes decisions regarding IT infrastructure and business management (DB) makes decisions regarding IT development and IT applications. The case of Pyrasus describes the allocation of decision-making for IT infrastructure, IT development and IT applications to, respectively, corporate IT management, business management and IT management (DT) (Pattern 7).

In contrast, Athens, Corinth and Harma are characterized by a low level of differentiation in which only corporate IT management and IT management are involved. In the case of Athens and Harma, IT management makes decisions regarding IT development and IT applications (Pattern 3), whereas in the case of Corinth, corporate IT management makes decisions regarding IT infrastructure and IT development (Pattern 1).

Table 6.2. Differentiation of Information Governance design.

Degree of Differentiation	**LOW** →							**HIGH**
IT Applications	DT	CM	DT	DB	CM	DB	DT	DB
IT Development	CM	DT	DT	CM	DB	DT	DB	DB
IT Infrastructure	CM	CM	CM	CM	CM	CM	CM	CM
Case Study (Pattern)	*Corinth (1)*		*Athens Harma (3)*				*Pyrasus (7)*	*Argos Sparta (8)*

CM = Centralized Corporate (IT) Management (Corporate level);
DT = Decentralized Division-IT management (LoB/SBU level);
DB = Decentralized Business-Division Management (LoB/SBU level).

With regard to the integration of decision-making for IT, the results indicate that various types of integration mechanisms are used (Table 6.3). With regard to direct structural integration, the following mechanisms are used in all of the cases: direct contact, project teams, project management, steering committee.

In the Harma and Sparta cases, additional direct structural integration mechanisms are used. These integration mechanisms are 'integrating roles' and/or 'integrating departments', including relationship managers, account managers, information managers, IT program management, competence centers and IT project offices.

Various indirect structural coordination mechanisms are used, including cross-training (Argos, Sparta), IT workshops (Argos, Pyrasus, Sparta), job-rotation (Argos, Pyrasus, Sparta), co-location (Argos, Athens, Harma, Pyrasus) and communication infrastructures (Corinth, Sparta). In the Argos, Pyrasus and Sparta cases, indirect structural integration is characterized by the simultaneous use of several mechanisms, describing a higher degree of structural information processing capability.

The process integration mechanisms in the cases describe both comprehensive and narrow decision-making processes for IT. Argos, Pyrasus and Sparta are characterized by comprehensive decision-making, reciprocal and full integration of business and IT decisions, and active conflict resolution through debate and negotiation. The comprehensive decision-making processes are characterized by a standardized and formalized process of business case problem definition/structuring, and the assessment of alternatives. When discussing IT in management team meetings, the Argos uses the motto:

> *"No nice to have, only must have, design for budget and fitness for use".* – Argos Business Manager

According to an Argos business manager:

> *"IT projects are monitored and assessed on time control, budget control, functionality and customer satisfaction".* – Argos Business Manager.

Strategic monitoring and evaluation of IT initiatives are part of the IT decision-making processes in Argos, Pyrasus and Sparta. The process integration mechanisms at Argos, Pyrasus, and Sparta are also characterized by informal (indirect) discussions between business and IT management. Management and/or business forums are used to exchange ideas, discuss problems and assumptions, and resolve conflicts.

Athens, Corinth and Harma, on the other hand, are characterized by narrow decision-making, administrative-sequential integration of business and IT decisions, and passive resolution of conflicts through forcing or avoidance. In these cases, conflicts remain between business and IT management.

At Harma, different business and IT stakeholders indicate:

> *"In practice there is still a feeling of 'us against them', and project reports are too often informal and not always according to the agreements".* – Harma Business Manager.

> *"The roles, responsibilities and relevance of projects is not always clear, and too often conflicts arise between business and IT. As a consequence, we have endless discussions that result in budget and time overruns and low functionality".* – Harma Senior IT Manager.

The IT decision-making processes in these companies are characterized by a lack of problem structuring, i.e., no clear business case, and a lack of evaluation or strategic monitoring of IT initiatives. Furthermore, Athens, Corinth and Harma are characterized by a lack of process integration. As the cases indicate, assumptions and perspectives remain concealed and conflicts between business and IT stakeholders unresolved.

With regard to collaborative integration, the case study results indicate that the scope of stakeholder participation differs across the cases. Whereas the cases of Argos, Pyrasus and Sparta are characterized by a wide scope of stakeholder participation, including corporate management, corporate IT management, business management and IT management, the cases of Athens, Corinth and Harma are characterized by a more narrow scope of stakeholder participation, involving corporate IT management and IT management. In the latter cases, corporate and business management participate occasionally in decision-making regarding IT, but their involvement is not as structural and in-depth as corporate IT management and IT management.

In the cases of Athens, Corinth and Harma, there is also a lack of mutual or shared understanding of business and IT objectives and between business and IT managers. In the cases of Argos, Pyrasus and Sparta, business and IT management share a mutual understanding of each other's objectives and concerns, and share an 'enabling vision' regarding the role of IT:

> *"In the last two years we have developed a culture of open communication, shared understanding, and working together for the benefit of our customers".* – Argos Business Manager.

On the other hand, a business manager at Harma indicates:

"Identifying objectives and performance measures is easy, but agreeing on these objectives and measures across business and IT, and the different management levels is tricky. Different parochial cultures exist with different interests, and we still need to break through these mental barriers. It's a learning process that takes time, effort and commitment". – Harma Business Manager.

Table 6.3. Case Study Summary of Integration Mechanisms for Information Governance.

Case Study	Structural Mechanisms		Process Mechanisms		Collaborative Mechanisms	
	Direct	Indirect	Direct	Indirect	Direct	Indirect
Argos	Direct contact Steering committee Task force Project management Project teams	Cross-training IT workshops Job-rotation Co-location	Comprehensive decision-making Reciprocal/Full integration Active conflict resolution	Management forum for debate and discussions	Wide stakeholder participation: Business and IT stakeholders	Mutual understanding of business and IT objectives
Athens	Direct contact Steering committee Project management Project teams	Co-location IT Workshops	Narrow decision-making Administrative/ Sequential integration (moving towards reciprocal) Passive conflict resolution	IT Management forum	Narrow stakeholder participation: Only IT stakeholders	Lack of mutual understanding of business and IT objectives
Corinth	Direct contact Steering committee Project management Project teams	Shared project database IT Workshops	Narrow decision-making Administrative/ Sequential integration Passive conflict resolution	Occasional IT Management workshops	Narrow stakeholder participation: Only IT stakeholders	Lack of mutual understanding of business and IT objectives
Harma	Direct contact Steering committee Project management Project teams Account managers Competence centers IT Program Management Information Management	Co-location IT Workshops	Narrow decision-making (moving towards more comprehensiveness) Administrative/ Sequential integration (moving towards reciprocal) Passive conflict resolution	Occasional IT Management workshops	Narrow stakeholder participation: Only IT stakeholders	Lack of mutual understanding of business and IT objectives
Pyrasus	Direct contact Steering committee Task force Project management Project teams Account managers	Shared project database Job-rotation Co-location IT workshops	Comprehensive decision-making Reciprocal/Full integration Active conflict resolution	Informal discussions concerning business problems / new opportunities	Wide stakeholder participation: Business and IT stakeholders	Mutual understanding of business and IT objectives
Sparta	Direct contact Business portfolio committee Executive steering committee IT advisory council Project teams Relationship managers Project management Project office	Electronic project management tools (shared database) Cross-training Job-rotation IT Workshops	Comprehensive decision-making Reciprocal/Full integration Active conflict resolution	IT Vision work shops Business forum	Wide stakeholder participation: Business and IT stakeholders	Mutual understanding of business and IT objectives

6.4.3 Strategic Outcome: IT Business Value

Regarding the strategic outcome, the results indicate that Athens, Corinth and Harma are characterized by low business value appropriation from IT, whereas Argos, Pyrasus and Sparta are characterized by high business value appropriation from IT. More specifically, in the cases of Athens, Corinth and Harma, business and IT management describe the lack of system functionality and system quality, the low responsiveness of the IT organization regarding IT services, the problems of project budget and time overruns, and the lack of significant IT impact on business processes, products, services and/or structures (Table 6.4).

Table 6.4. Case Study Summary of IT Business Value Outcome

STRATEGIC OUTCOME	Argos	Pyrasus	Sparta	Athens	Corinth	Harma
IT Performance	Improved IT infrastructure services Shared information architecture On-time, functional delivery	Improved IT infrastructure services Shared information architecture On-time, functional delivery	Improved IT infrastructure services Shared information architecture On-time, functional delivery	Improved IT infrastructure services Shared information architecture Lack of system functionality and quality Budget overruns	Legacy system integration Lack of Information Architecture Lack of system functionality and quality Budget overruns Lack of IT competency	Legacy system integration Lack of Information Architecture Fail to meet time, costs, quality and functional requirements
Business Performance	Increased time-to-market Reduced transaction-costs Cross-Business-Collaboration Continued product innovation Improved customer satisfaction Sustained market growth	Increased time-to-market Reduced transaction-costs Continued product innovation Improved distribution Sustained market growth Improved business capabilities for innovation	Increased time-to-market Reduced transaction-costs Corporate synergies Continued product innovation Improved distribution Improved customer satisfaction Sustained market growth	Some efficiency improvement Streamlining processes still problematic Lack of strategic product and service innovation Time-to-market too slow Organizational innovativeness and flexibility still need improving	Product innovation too long No significant added value of IT; more of an inhibitor Are we adding value to our customers? Lack of business innovation	Some cost reduction Lack of productivity improvement Streamlining business processes still missing Lack of product innovation Lack of business innovation
Business Grade	8	8	8.5	6	4	5

At Corinth and Harma, stakeholders argue:

> *"The quality of IT is a disgrace".* – Corinth Business Manager.

> *"Projects are always over time and over budget. That's a fact of life here".* – Corinth Business Manager.

> *"IT is more of an inhibitor, than an enabler".* – Corinth IT Manager.

> *"Improved time-to-market, flexible systems, and service innovation are key objectives, that have not improved significantly from the investments in IT".* – Harma Business Manager.

> *"Our company is not getting the expected value for money from investments made in IT".* – Harma Corporate Manager

Furthermore, in comparison to Argos, Pyrasus and Sparta, Athens, Corinth and Harma have experienced a relatively lower growth rate in premium income over the past four years (see also Chapter 5, Table 5.1). Business and IT management in Argos, Pyrasus and Sparta also indicate that they are satisfied with IT operations, IT services and IT impacts on business processes, products, services and structures.

Business and IT managers at Pyrasus and Sparta indicate:

> *"IT contributes significantly to business value".* – Pyrasus Senior IT Manager

> *"Without IT, business improvements and added-value would not have been possible".* – Sparta Business Manager.

> *"While there is no question that IT is of added value to our products, services and processes, we are not a perfect 10".* – Sparta Corporate Executive.

In Figure 6.4, the performance ranks (based on the relative growth in premium income) and the performance assessment (based on a scale from 0 to 10) by business executives is plotted. The scatter plot reveals that Argos, Pyrasus and Sparta have a relatively higher growth in revenue, and are relatively more satisfied with the contribution of IT to business performance improvement. In Athens, Corinth and Harma, business executives rate the contribution of IT to business performance improvement relatively lower, and the growth rate in premium income is also relatively lower in comparison to Athens, Pyrasus and Sparta.

The scatter plot supports the findings in which:
- Business and IT managers in *Athens, Pyrasus and Sparta* indicate that the business value appropriation from investments in IT is relatively *high*;
- Business and IT managers in *Argos, Corinth, and Harma* indicate that the business value appropriation from investments in IT is relatively *low*.

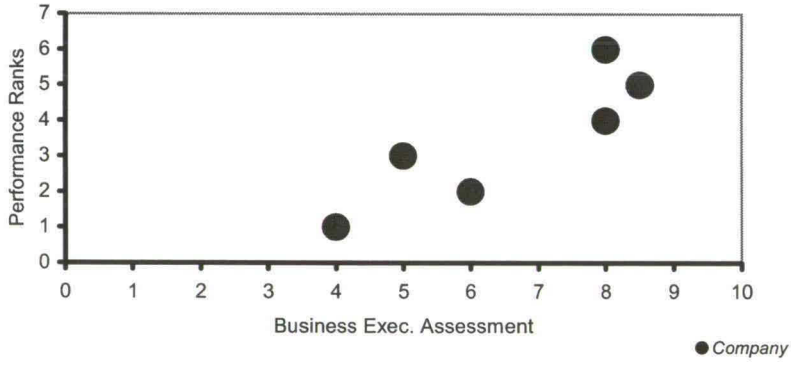

Figure 6.4. Scatter-plot: Company performance rank and business executive performance assessment.

Based on these results, the case studies are grouped in two clusters, respectively, a 'high performance cluster' (Athens, Pyrasus, Sparta) and a 'low performance cluster' (Argos, Corinth, Harma). In Section 6.4.4, patterns within and across the high and low performance case study clusters of case studies are analyzed and discussed.

6.4.4 Pattern Analysis

The different patterns of similarities and differences, within and across the case study clusters, are graphically summarized in Table 6.4. For each case study an interpretation of high, moderate, or low is provided for the different dimensions of the theoretical framework. Similarities between the case study clusters are depicted in dark gray, whereas the differences are depicted in light gray.

Table 6.4. Patterns within and across the cases.

Case / Construct	ARGOS	PYRASUS	SPARTA	ATHENS	CORINTH	HARMA
STRATEGIC CONTEXT						
Goal Diversity	High	High	High	High	High	High
Goal Uncertainty	High	High	High	High	High	High
INFORMATION GOVERNANCE DESIGN						
A. Differentiation	High	High	High	Low	Low	Low
B. Integration						
Structural	High	High	High	High	High	High
Infrastructural	High	High	High	Low	Low	Low
Process (Decision-making)	High	High	High	Low	Low	Low
Process (Conflict-resolution)	High	High	High	Low	Low	Low
Collaborative (Participation)	High	High	High	Low	Low	Low
Collaborative (Shared Understanding)	High	High	High	Low	Low	Low
STRATEGIC OUTCOME						
IT Performance	High	High	High	Moderate	Low	Low
Business Performance	High	High	High	Low	Low	Low
Business Grade	High	High	High	Moderate	Low	Low
CLUSTER	HIGH PERFORMANCE			LOW PERFORMANCE		

With regard to the strategic context and the multiplexity of the value set, both low and high performing clusters depict high goal diversity and high goal uncertainty (see also Section 6.4.1).

The level of differentiation decision-making for IT differs across the case study clusters (see also Section 6.4.2). Whereas the high performance cluster is characterized by high differentiation, the low performance cluster is characterized by low differentiation (Figure 6.5). More specifically, the difference in differentiation between the clusters is characterized by the involvement of business management in decision-making for IT (see also Table 6.2). In the high performance case studies (i.e., Argos, Pyrasus, and Sparta) business management is responsible for decision-making regarding either IT applications or IT development.

Across the case study clusters, two distinct patterns emerge regarding the integration of decision-making for IT (see also Section 6.4.2). Structural integration mechanisms are present and used in all of the case studies, across high and low performance clusters. Structural integration is not a differentiating factor between high and low performance case studies. However, the high and low performance clusters do differ in the infrastructural, process and collaborative integration mechanisms (see also Table 6.3.).

Specifically, the following distinguishing features characterize the high performance case studies (i.e., Argos, Pyrasus, and Sparta):
- Cross-training and job-rotation of business and IT managers (infrastructural integration);
- Comprehensive and integrated decision-making for IT, and active conflict-resolution through confrontation and negotiation (process integration);
- Active participation by both business and IT managers, and a shared understanding between business and IT managers of each other's objectives (collaborative integration).

These case studies demonstrate a higher integration capability, in comparison to the low performance case studies (Figure 6.5). The low performance case studies (i.e., Athens, Corinth and Harma) are characterized by:
- Co-location (infrastructural integration);
- Administrative, ad-hoc decision-making for IT, and passive conflict-resolution through avoidance and smoothing over (process integration);
- Lack of active participation by business managers, and a lack of mutual understanding of business and IT objectives between business and IT managers.

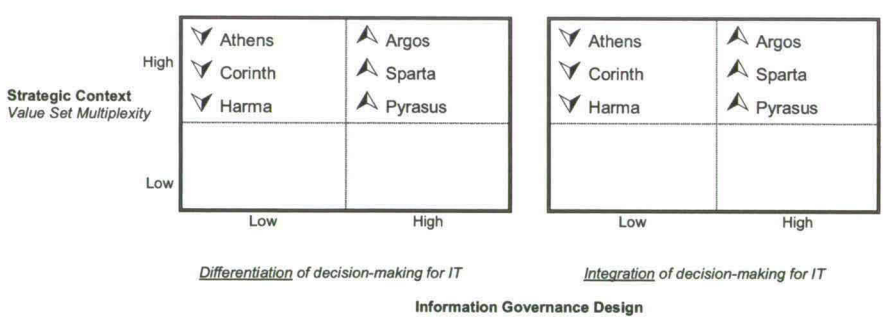

Figure 6.5. Scatter-plots: Strategic context and Information Governance design.

The pattern analysis indicates that high performance case studies (Argos, Pyrasus, and Sparta) are characterized by both high differentiation and integration of decision-making for IT. In comparison, the low performance case studies are characterized by both low differentiation and low integration of decision-making for IT (Figure 6.6).

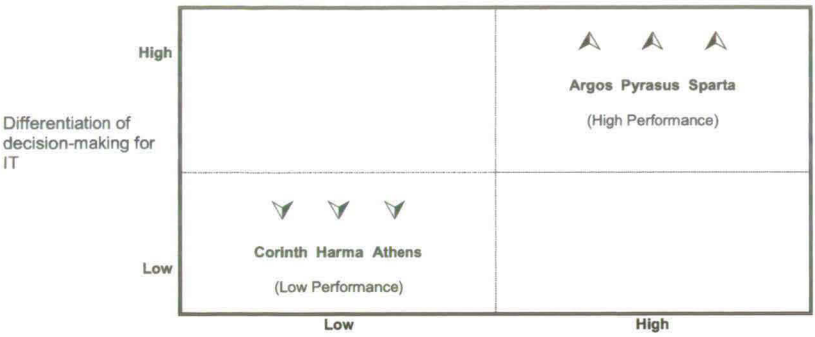

Figure 6.6. Scatter-plot: Information Governance design and IT business value.

6.5 Validation of the Conceptual Framework

In Chapter 4, five propositions were formulated. These were stated as:

> ***Proposition 1: Goal diversity is associated with a hybrid decision-making system for IT, involving both centralized and decentralized decision-making units.***
>
> ***Proposition 2: Selective decentralization of Information Governance is associated with the use of (supplementary) horizontal coordination mechanisms.***
>
> ***Proposition 3: Goal uncertainty in the strategic context is associated with the use of (supplementary) horizontal coordination mechanisms.***
>
> ***Proposition 4: Higher levels of differentiation of decision-making for IT require higher levels of decision-making integration for IT in order to realize high IT business value.***
>
> ***Rival Proposition: High IT business value is associated with a hybrid configuration for Information Governance, regardless of the level of decision-making integration for IT.***

These propositions were formulated based on the literature review, and were used to extend the traditional research model, to develop the conceptual framework (Figure 6.7). In this section, the support for the conceptual framework and the underlying propositions are discussed.

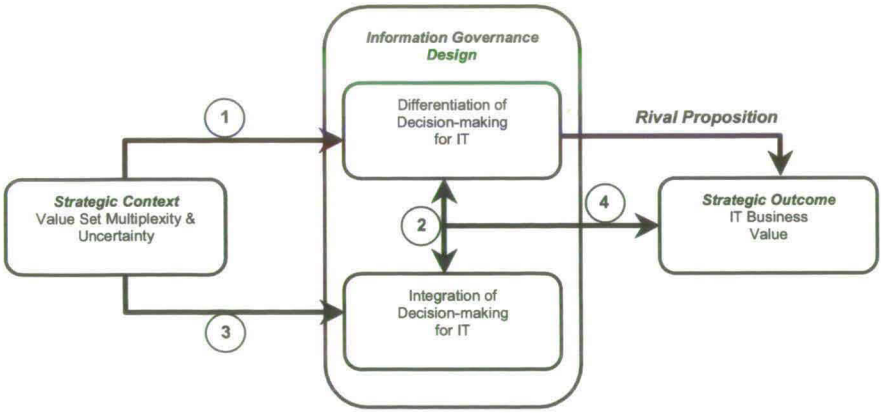

Figure 6.7. Conceptual framework.

6.5.1 Strategic Context & Information Governance Differentiation

Proposition 1: Goal diversity is associated with a hybrid decision-making system for IT, involving both centralized and decentralized decision-making units.

The case study analysis and results provide support for this proposition. In each of the cases, the strategic context is described by multiple value sets, and a hybrid decision-making system for IT, involving centralized decision-making for IT infrastructure, and decentralized decision-making for IT development and/or IT applications (see also Table 6.1; Table 6.2; Table 6.4; Figure 6.5; Figure 6.6).

The results also indicate that for the high performing case studies:

- A dominant customer value proposition is associated with the horizontal decentralization of decision-making for IT application, involving business management (see Table 6.1/6.2, Argos and Sparta);
- A dominant complex innovation proposition is associated with the vertical decentralization of decision-making for IT application, involving IT management (see Table 6.1/6.2, Pyrasus);
- Customer value and complex innovation are associated with the horizontal decentralization of decision-making for IT development, involving business management (see Table 6.1/6.2, Argos, Pyrasus and Sparta);
- The supporting value propositions for operational and collaborative excellence are associated with the centralization of IT infrastructure, involving Corporate IT management.

In the case of low performance case studies, customer value is not associated with the horizontal decentralization of decision-making for IT application (see Table 6.1/6.2, Corinth), and complex innovation is not associated with vertical decentralization of decision-making for IT application (see Table 6.1/6.2, Athens). Furthermore, customer value and complex innovation are also not associated with the horizontal decentralization of decision-making for IT development, involving business management (see Table 6.1/6.2, Athens, Corinth, and Harma).

These findings support previous studies that the recent emergence of the federal model for Information Governance reflects the resolution of conflicting contingencies through the division and redesign of the decision-making system (Daft, 1998; Galbraith, 1994; Gresov & Drazin, 1997; Mintzberg, 1979; Hitt et al., 1998; Tushman & O'Reilly, 1998). The decision-making system is subdivided to yield operational excellence and synergy under the centralization of the IT infrastructure, as well as innovation and responsiveness under the decentralization of IT development and/or IT applications (Brown & Magill, 1994, 1998; Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998).

6.5.2 Differentiation & Integration of Information Governance

Proposition 2: Selective decentralization of Information Governance is associated with the use of (supplementary) horizontal coordination mechanisms.

The case study analysis and results provide support for this proposition. In each of the cases, selective decentralization and differentiation of decision-making for IT is associated with horizontal coordination mechanisms, albeit with different levels of integration capability (see also Table 6.2; Table 6.3; Table 6.4; Figure 6.5; Figure 6.6). The results indicate that the companies adopt an IT-centric or business-centric model in the differentiation of Information Governance. In the cases of Corinth, Athens and Harma, an IT-centric model for Information Governance is used, whereas in the cases of Argos, Pyrasus and Sparta, a business-centric model for Information Governance is present (see Table 6.2).

These horizontal coordination mechanisms supplement the vertical/hierarchical coordination mechanisms. The selective decentralization of decision-making for IT creates horizontal and reciprocal interdependencies between business and IT management, which need to be addressed by horizontal coordination mechanisms, involving greater information processing capabilities. The reciprocal interdependency and the associated need for greater information processing between decision-making units is influenced by the interdependency between the IT sub-functions within the IT portfolio, and the

interdependency between IT and business systems in the organization's operational system (Boynton et al., 1992; Sambamurthy, 2000; Weill & Broadbent, 1998).

The findings support previous studies that indicate that selective decentralization increases the complexity of interdependency, and the diversity of goal orientations within the Information Governance system (March & Simon, 1958; Lorsch & Lawrence, 1970; Daft, 1998; Galbraith, 1973,1994; Gresov & Drazin, 1997; Mintzberg, 1979; Brown & Magill, 1998; Sambamurthy & Zmud, 1999; Weill & Broadbent, 1998; Parker et al., 1997; DeSanctis & Jackson, 1994). Selective decentralization, and subsequent goal differentiation and interdependence, beget greater information processing needs, thereby requiring greater information processing capabilities on the part of the Information Governance system (De Leeuw, 1990; Daft & Lengel, 1984; Galbraith, 1973, 1994; Lorsch & Lawrence, 1970; Thompson, 1967). This requires the use of supplementary **structural integration mechanisms**, including contact, liaison roles and steering committees.

Previous IS studies indicate that executive behaviors between business and IT stakeholders often include direct personal means of coordination in order to discuss IT agendas and resolve conflicts between business and IT managers (Dutta, 1996; Elam et al., 1988; Feeny et al., 1992; Luftman & Brier, 1999). Furthermore, with regard to liaison roles, previous IS studies indicate that account and relationships managers manage accounts of business units by partnering with their business clients in anticipating strategic opportunities for IT applications and by serving as the business' primary point of contact with the IT organization (Clark et al., 1997; Cross et al., 1997). Nambisan et al. (1999) indicate that relationship managers provide personal help to users in identifying and evolving new IT application ideas. Ross et al. (1996) conclude that the use of account managers and relationship managers aid IT managers to develop an improved understanding of business needs, and aid in proactive - versus reactive - behavior by IT managers. The use of direct contacts between business and IT stakeholders is found in all of the case studies.

The results also support previous studies that steering committees are a common structural integration mechanism (Applegate et al., 1999; Drury, 1984; Elam et al., 1988; Nambisan et al., 1999; Weill & Broadbent, 1998; Zmud, 1984). Steering committees are used in all of the case studies. Previous IS studies report an increase in the use of integrating functions in the form of project and program managers, particularly in the case of large-scale IT-induced business change programs (Blanton et al., 1992; Brown, 2000; Luftman & Brier, 1999; Sambamurthy & Zmud, 1999; Willcocks et al., 1997). Integrating functions in the form of project managers are used in all of the case studies.

The use of design and expertise centers - 'centers of excellence' - have also been reported in IS literature (Applegate et al., 1999; Clark et al., 1997; Cross et al., 1997; Ross et al., 1996; Weill & Broadbent, 1998). Design and expertise centers pool knowledge from different functional areas and focus on developing organizationally valued - business and IT - skill sets, including e.g., project management, system development, and e-commerce innovation (Hartman & Sifonis, 2000; Marchand et al., 2000; Weill & Broadbent, 1998). The use of design and expertise centers is present in Harma and Sparta.

Regarding **infrastructural coordination**, the use and importance of cross-training between business and IT functions (Applegate et al., 1999; Elam et al., 1988; Henderson, 1990; Luftman & Brier, 1999; Rockart et al., 1996; Willcocks et al., 1997), is supported by the results of this study. Likewise, consistent with previous IS studies (Brown, 2000; Luftman & Brier, 1999; Ross et al., 1996; Weill & Broadbent, 1998), the results indicate that job-rotation is an important mechanism in improving communication and network relationships among business and IT managers. Managers with inter-functional and inter-business unit experience are more likely to establish reciprocal working and personal relationships, and learn to influence without the use of formal authority (Galbraith, 1994). The use of cross-training and job-rotation mechanisms is particularly dominant in the high performance cluster of case studies (Argos, Pyrasus, and Sparta).

Co-location and communication infrastructures are also encountered in the case studies, and have been reported in the IS literature as important mechanisms for coordination. Ross et al. (1996) describe the co-location of IT account managers and IT system development groups in business client units, while Brown (2000) reports the co-location of IT managers with system development responsibilities to business operating units in order to 'blend in with the customer organization'. Physical proximity barriers, however, can be overcome through the adoption and use of IT networks and communication

infrastructures (Applegate et al., 1999; Brown, 2000; Daft, 1998; DeSanctis & Jackson, 1994; Galbraith, 1994; Galbraith & Lawler, 1993; Hitt et al., 1998). Galbraith & Lawler (1993) argue that as sophisticated and advanced communication technology infrastructures interconnect business functions and decision-making units, the traditional conceptualization of direct structural integration mechanisms becomes obsolete. Communication infrastructures have the potential to enable rapid and responsive decision-making and communication across time and space dimensions (DeSanctis & Jackson, 1994; Weill & Broadbent, 1998).

The case study results also support previous IS studies (Boynton et al., 1992; Broadbent & Weill, 1993; Brown, 1997; Peppard & Ward, 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998), which describe the importance of **comprehensive IT decision-making**, and **the resolution of conflicts** between business and IT stakeholders. Consistent with the studies by Broadbent & Weill (1993), Chan et al. (1997), Teo & King (1996, 1997, 1999), and Weill & Broadbent (1998), the case study results indicate that the reciprocal integration of business and IT decisions is associated with less IT implementation problems and improved organizational performance.

Moreover, the results indicate that in complex and uncertain environments comprehensive - formal - decision-making is more effective, in comparison to less formal decision-making for IT. This conclusion is in line with studies that emphasize the acquisition and exhaustive analysis of information about strategic alternatives, and the formal integration of decisions based on procedures and standard methodologies (Ansoff, 1965; Eisenhardt, 1989; Goll & Rasheed, 1997; Galliers, 1993; Lederer & Salmela, 1996; Premkumar & King, 1991; Salmela et al., 2000; Teo & King, 1997), and in contradiction to studies that prescribe less comprehensiveness in dynamic environments (Ciborra, 1994; Fredrickson & Iaquinto, 1989; Mintzberg, 1979; Pyburn, 1983).

The case studies support previous studies that strategic decision-making for IT involves conflicting and competing goals and interests between business and IT management (Boynton et al., 1992; Broadbent & Weill, 1992; Brown, 1997; Peppard & Ward, 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998). More importantly, conflict resolution by confrontation is a more effective means of resolving conflicts in comparison to smoothing over or avoidance (Eisenhardt, 1989; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970). Robey et al. (1993) also found that conflicts, when successfully resolved, contribute to IT success, but that unresolved conflict is negatively correlated with success.

Confrontation strategies resolve conflicts through the active explication of underlying assumptions regarding decision objectives and alternatives. Benefits have been ascribed to the positive tension that arises from crossing experientially and cognitively different viewpoints. Jehn (1997) indicates that organizations perform more effectively when they experience task-related conflicts stemming from having different perspectives on a problem. Senge (1990) suggests that innovative ideas and practices often arise from the combination of very different viewpoints into a 'creative tension'. Lawrence & Lorsch (1969) and Lorsch & Lawrence (1970) conclude that confrontations increase the likelihood of developing long term collaborative working relationships.

Markus (1983) and Weill (1992) report that in politically turbulent environments, individuals and groups act in their own interest, and this reduces the likelihood of a uniform commitment to the use and successful exploitation of IT. Weill & Broadbent (1998) conclude that unresolved conflicts decrease the adaptability to change, waste resources, and misdirect innovation, thereby reducing the effect of IT on organizational performance. The passive (non-) resolution of conflicts is particularly present in the low performance cluster of case studies (Athens, Corinth, and Harma).

The results of this study also underscore the importance of **collaborative integration mechanisms**. Comparing the low performance case studies with the high performance case studies, the results indicate that stakeholder participation and shared understanding are key distinguishing features in the cluster of high performance case studies. The results support previous studies that report a positive effect of participation in decision-making on organizational performance satisfaction (Cotton et al., 1988; Wagner, 1994).

The results of this study are also consistent with the findings of previous IS studies that provide evidence that the involvement of business management in decision-making for IT is of strategic importance (Boynton et al., 1994; Broadbent & Weill, 1993; Doherty et al., 1999; Dutta, 1996; Garrity, 1963; Jarvenpaa & Ives, 1991; Keen, 1991; Peppard & Ward, 1999; Rockart et al., 1996; Ross et al.,

1996; Weill & Broadbent, 1998; Willcocks et al., 1997). Given the interconnectedness and mutual influence of business and IT decisions in strategic decision-making, the collaborative participation of business and IT decision-making units is pivotal to value appropriation from IT. Ross et al. (1996) conclude that the collaborative participation between business and IT is a relationship-specific asset in developing long-term organizational competitiveness.

With regard to shared understanding, the results of this study support previous IS studies that shared understanding between business and IT constituencies has a positive effect on value appropriation from IT. Crowston & Kammerer (1998) conclude that shared understanding between functionally differentiated sub-units, in a manner that enables each sub-unit to effectively comprehend the objectives and perspectives of the other sub-unit, not only facilitates meaningful dialogue to achieve acceptable resolutions to differences, but also creates a context for more innovative use of IT. Nelson & Cooprider (1996) conclude that increasing levels of shared understanding between business and IT management leads to improved IT business value. Orlikowski & Gash (1994) indicate that incongruent reference frames provides an interesting explanation of the difficulties and unanticipated outcomes associated with the implementation of IT.

6.5.3 Strategic Context & Information Governance Integration

Proposition 3: Goal uncertainty in the strategic context is associated with the use of (supplementary) horizontal coordination mechanisms.

The case study analysis and results provide support for this proposition. In each of the cases, the strategic context is described by high goal uncertainty, due to the dominant and supporting value propositions (see also Table 6.1). In all of the cases, Information Governance integration is associated with horizontal coordination mechanisms, albeit with different degrees of integration capability (see also Table 6.3; Table 6.4; Figure 6.5; Figure 6.6).

The goal uncertainty induced by customer value and complex innovation (for both dominant and supporting value propositions) requires greater information processing, which is achieved through the use of horizontal coordination mechanisms, involving, structural, process and collaborative integration. These mechanisms for integration supplement vertical/hierarchical integration.

The results of this study support the findings of previous studies that uncertainty in the strategic context is associated with the use of horizontal coordination mechanisms (March & Simon, 1958; March, 1988; Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970; Daft & Lengel, 1986; Daft, 1998; Galbraith, 1973, 1994; Treacy & Wiersema, 1995; Tushman & Nadler, 1978; Gresov & Drazin, 1997; Mintzberg, 1979; Buenger et al., 1996; Brown & Magill, 1998; Weill & Broadbent, 1998).

The importance of (a) structural and infrastructural coordination; (b) comprehensive IT decision-making and conflict-resolution between business and IT stakeholders; and (c) active participation and shared understanding between business and IT stakeholders is supported by previous IS studies (see Section 6.5.3). More importantly, the case study results indicate that while structural integration is necessary condition to address the complex interdependencies in the differentiation of IT decision-making, the uncertainty and equivocality stemming forth from the strategic context require process and collaborative integration mechanisms. Thus, whereas structural integration mechanisms are a necessity, they are insufficient for adequately integrating decision-making for IT. This finding supports previous studies that indicate that effective integration of decision-making also needs to include process and collaborative integration mechanisms (Daft & Lengel, 1984; Galbraith, 1994; Lawrence & Lorsch, 1967; 1969; Lorsch & Lawrence, 1970; Malone & Crowston, 1994).

6.5.4 Differentiation, Integration & Performance

Proposition 4: Higher levels of differentiation of decision-making for IT require higher levels of decision-making integration for IT in order to realize high IT business value.

The case study analysis and results provide support for this proposition (see also Table 6.2; Table 6.3; Table 6.4; Figure 6.5; Figure 6.6). Specifically, in the cases of Argos, Pyrasus and Sparta (i.e., high

performance cluster), high levels of Information Governance differentiation (i.e., business-centric model) are associated with high levels of Information Governance integration (i.e., integration capabilities associated with process and collaborative integration).

In contrast, the cases of Athens, Corinth, and Sparta (i.e., low performance cluster), low levels of Information Governance differentiation (i.e., IT-centric model) are associated with low levels of Information Governance integration (i.e., integration capabilities associated with structural integration). Business value appropriation from IT is thus associated with both high levels of Information Governance differentiation and Information Governance integration.

These results are consistent with the findings of previous organization and IS studies (Lawrence & Lorsch, 1967, 1969; Daft & Lengel, 1986; Tushman & Nadler, 1978; Ellinger et al., 1999; Galbraith, 1994; Griffin & Hauser, 1996; Gupta et al., 1986; John & Rue, 1991; Kahn, 1996; Kahn & McDonough, 1997; Kahn & Mentzer, 1998; Olson et al., 1995; Powell, 1992; Song et al., 1993; Henderson, 1990; Parker et al., 1997; Weill & Broadbent, 1998)

Low levels of differentiation in the Information Governance system involve solely IT decision-making units and managers. Managers in IT decision-making units share the same professional background and work environment, and therefore experience less differentiating goal-orientations and reference frames (Lind & Zmud, 1991; Nelson & Cooprider, 1996; Orlikowski & Gash, 1994; Weill & Broadbent, 1998). Goal-orientations and working practices are less variable within organizational units, then they are across different organizational units (Daft, 1998; Lawrence & Lorsch, 1967, 1969; Schein, 1996; Scott, 1998; Van de Ven & Ferry, 1980). Structural and process integration may therefore suffice in order to coordinate decision-making for IT.

However, as business decision-making units engage in decision-making for IT - vertical and horizontal decentralization -, differences in goal-orientations and working practices proliferate, and the level of differentiation in the Information Governance system increases. Consequently, higher levels of integration capability, i.e., collaborative integration, are necessary for achieving organizational effectiveness. The results of this study support Lawrence & Lorsch's (1967; 1969) central thesis that in complex and uncertain contexts, high levels of differentiation need to be matched by the appropriate degree of integration for achieving organizational effectiveness.

6.5.5 Information Governance Differentiation & Performance

***Rival** Proposition: High IT business value is associated with a hybrid configuration for Information Governance, regardless of the level of decision-making integration for IT.*

Several studies have described the federal model for Information Governance as a necessary and sufficient condition for reaping business benefits from IT. Robson (1997) states that the federal model is now the norm. Von Simson (1990) states that the federal model is the best model, 'capturing the best of both - centralized and decentralized - worlds'. Rockart et al. (1996) describe the federal model as one the fundamental imperatives of IT in the late 1990s, and urge organizations to adopt the federal model, regardless of organizational contingencies. Earl (2000) argues that every company needs to build a degree of IT federalism.

This rival proposition is *not* supported by any of the case studies. High IT business value is not associated solely with a hybrid configuration for Information Governance, regardless of the level of integration of decision-making for IT (see also Table 6.2; Table 6.3; Table 6.4; Figure 6.5; Figure 6.6). In fact, the low performance case studies (i.e., Athens, Corinth, and Harma) are associated with a federal model, a lack of integration capability and low IT business value. In contrast, the high performance case studies (i.e., Argos, Pyrasus, Sparta) are associated with a federal model, high integration capability and high IT business value.

Contrary to the claims made by Earl (2000), Robson (1997), Rockart et al. (1996), and Von Simson (1990), that the federal model is the 'best model', the results of this study indicate that merely differentiating and allocating IT decision-making without considering (structural, process and collaborative mechanisms) of integration, will not result in business value appropriation from IT. The explanation and logic lies in Lawrence & Lorsch's (1967; 1969) central thesis that in complex and

uncertain contexts, high levels of differentiation need to be matched by suitable integration for achieving organizational effectiveness.

6.5.6 Conclusion

In conclusion, Table 6.5 provides a summarized outline of the support for the conceptual framework, and the underlying propositions. Propositions 1, 2, 3, and 4 are supported by all of the case studies. The rival proposition is supported by none of the case studies.

Table 6.5. Summary of support for propositions.

Propositions / Case Study	1	2	3	4	Rival
Argos	Yes	Yes	Yes	Yes (High performance)	No
Athens	Yes	Yes	Yes	No (Low performance)	No
Corinth	Yes	Yes	Yes	No (Low performance)	No
Harma	Yes	Yes	Yes	No (Low performance)	No
Pyrasus	Yes	Yes	Yes	Yes (High performance)	No
Sparta	Yes	Yes	Yes	Yes (High performance)	No
Support	Yes	Yes	Yes	Yes	No

Following the support for the conceptual framework, Figure 6.8 portrays the analytically validated framework in this study.

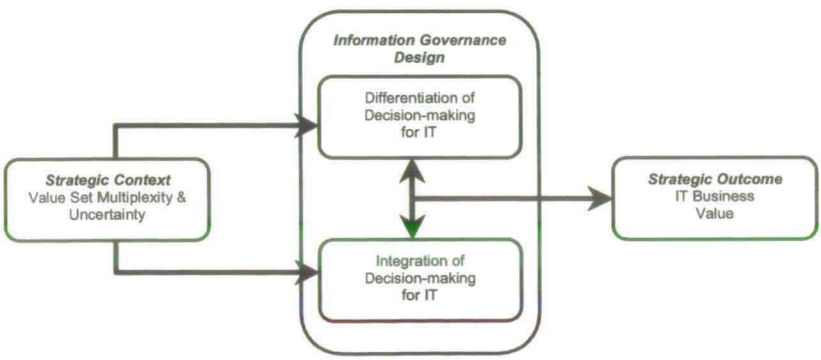

Figure 6.8. Analytically validated conceptual framework.

Chapter 7: Conclusions

And now nine years of mighty Zeus have gone by, and the timbers of our ships have rotted away and the cables are broken, and far away our wives and our young children are sitting within our halls and wait for us, while our work here stays forever unfinished. – Iliad

7.1 Introduction

In the foregoing chapter, the analysis and results of the case studies were presented. In this chapter, conclusions are drawn based upon the findings of the case studies on Information Governance. In Section 7.2, the research objectives, research questions and research demarcations are briefly recapitulated. The answers to the research questions, and the main lessons learned in this study are described in Section 7.3. The theoretical and organizational implications of the results of this study are discussed in Section 7.4. Following the main findings of this study, and the limitations of this study, several directions are proposed for future research on Information Governance in Section 7.5.

7.2 The Aim, Questions & Demarcations of this Study

The **aim of this study** on Information Governance was formulated as:

> *To gain understanding, through exploration and explanation, of the design logic regarding Information Governance in contemporary IT-intensive business environments, in order to (a) advance theory development on Information Governance, and (b) provide organizations with design strategies for improving Information Governance.*

This aim was formulated as a result of a review recent developments and previous studies on Information Governance. It was concluded that the confluence of increasingly competitive and IT-intensive business environments; competing demands for strategic flexibility and dynamic stability; and the growing evidence that organizations are experiencing difficulty in leveraging IT to develop sustainable electronic business environments; and the significant lack of relevant theory-laden models and empirical research, have rekindled significant debate and interest in a new organizing logic for Information Governance. In the introduction, it was also reported that Information Governance is a perennial item on the agendas of both business and IT executives as they seek to integrate IT with the ever-changing business environment. Subsequently, the **research problem** was summarized as:

- A limited amount of empirical research has been conducted up until the early to mid 1990s. There is no empirical evidence regarding Information Governance in contemporary IT-intensive business environments;
- There is a considerable gap growing between scholarly research and contemporary practice. The accumulated wisdom from the past decades is inadequate in shaping appropriate insights for contemporary and future Information Governance designs. There is a considerable gap growing between scholarly research and contemporary practice;
- The complexity of 'the' federal Information Governance model remains concealed. There is no empirical evidence regarding the different patterns in the differentiation of decision-making structures for IT;

- The nature and types of integration mechanisms utilized and relevant to the coordination of decision-making for IT is likewise limited. There is no empirical evidence regarding Information Governance integration from which any conclusions can be drawn;
- The outcome and performance impacts of Information Governance is not addressed in previous studies.

Based on the aim and research problem of this study, the following **research questions** were formulated:

1. *How and why is decision-making for IT divided in the federal model for Information Governance?*

   1.1. *Who are the primary stakeholders involved in strategic decision making of IT?*

   1.2. *Why do organizations differentiate strategic decision-making for IT?*

2. *How and why is decision-making for IT coordinated in the federal model for Information Governance?*

   2.1. *What (types of) coordination mechanisms are used to integrate IT decision-making across stakeholder constituencies and (intra-) organizational boundaries?*

3. *How is the division and coordination of decision-making for IT associated with business value appropriation from IT?*

   3.1. *How can organizations improve their design of Information Governance?*

Based on the research objectives and research questions, the research design of this study was introduced in Chapter 1, and discussed in Chapter 3. The research design explicitly described the following *demarcations* of this study:

- The use of organization design theory as the main reference discipline, and in particular, a contingency-based, information-processing, decision-making paradigm of organization and governance for developing the conceptual framework, identifying the theoretical constructs, and formulating the propositions (see Chapter 4);
- The focus on strategic decision-making across the range of exploitation and innovation activities for infrastructural and business applications of IT (see Chapter 4);
- The purposeful selection of six, large, multi-business-unit organizations operating in a complex, dynamic, IT-intensive, and Dutch Financial Services marketplace, with a federal model for Information Governance (see Chapter 3);
- The use of a multiple case study research design, geared at theory-building, focused on analytical generalization, and conducted at an (intra-) organizational unit of analysis (see Chapter 3);
- The focus on multiple interviews with business and IT stakeholders, and company document archive analysis for the collection of qualitative and quantitative data (see Chapter 5);
- The use of qualitative data analysis (profiling, coding and pattern-analysis) methods (see Chapter 5).

The lessons learned and conclusions (to be discussed in the remaining sections of this chapter) should be interpreted within the above-mentioned boundaries of this study.

7.3 Lessons Learned: Answers to the Research Questions

How do organizations in contemporary IT-intensive business environments govern their portfolio of information technologies; and what is the organizing logic of Information Governance? These were the general queries that motivated this investigation of Information Governance in the Financial Service organizations. This section presents the answers to the research questions, and describes the main lessons learned.

7.3.1 How and Why do Organizations Differentiate Information Governance?

This study indicates that organizations in contemporary Financial Service environments are experiencing competing demands with different foci for delivering customized, high quality products and services, compressing costs and time in order to market products efficiently and effectively, and streamlining intra- and inter-business unit processes. The Financial Service Institutions (FSI) have adopted multiple value sets for attending to the conflicting pressures of a complex and dynamic business environment.

With the proliferation and integration of IT in business processes, products and services of FSI, IT organizations in FSI are likewise experiencing the need to develop and deliver applications that facilitate business responsiveness to customer demands in a rapid and efficient manner, and provide cost-effective, scalable infrastructures and operations that enable enterprise-wide integrated and streamlined business processes. Business and IT managers experience these - often contradictory – dilemmas in their efforts at advancing IT-based business innovation, and optimizing the business value appropriation from IT.

FSI attend to these competing objectives by differentiating decision-making for IT across business and IT stakeholder communities. Specifically, the IT decision-making portfolio - decision-making for IT operations, IT innovation and business applications - is divided and allocated across corporate, business unit, and IT managers. The Information Governance system is differentiated to yield operational excellence and enterprise-wide integration under the centralized control of IT operations, as well as business innovation and responsiveness under the decentralized control business applications and/or IT-based innovation.

The results of this study indicate that a dominant customer value proposition is associated with the horizontal decentralization of decision-making for IT application, involving IT decision-making by business management. A focus on complex innovation as the main value proposition is associated with the vertical decentralization of decision-making for IT application, involving IT decision-making by IT management. Both customer value and complex innovation are associated with the horizontal decentralization of decision-making for IT development, involving IT decision-making by business management. The value propositions for operational and collaborative excellence are associated with the centralization of IT infrastructure, involving IT decision-making by corporate management.

Theoretically, 8 distinct patters of differentiation exist for a federal model of Information Governance (Table 7.1). These models differ in degree of differentiation of IT decision-making across IT and business management. This study indicates that FSI adopt either a business-centric, or an IT-centric model for Information Governance. The latter model does not involve business management as an active stakeholder, and - in this study - was found to be associated with low business value appropriation from IT. FSI with a business-centric model of federal Information Governance were associated with high business value appropriation from IT.

Table 7.1. Business and IT-Centric Models of Federal Information Governance.

Decision-Making for								
IT Applications	DT	CM	DT	DB	CM	DB	DT	DB
IT Development	CM	DT	DT	CM	DB	DT	DB	DB
IT Infrastructure	CM	CM	CM	CM	CM	CM	CM	CM
Federal Information Governance Models	***IT Centric***				***Business Centric***			

CM = Centralized Corporate (IT) Management (Corporate level);
DT = Decentralized Division-IT management (LoB/SBU level);
DB = Decentralized Business-Division Management (LoB/SBU level).

7.3.2 How and Why do Organizations Integrate Information Governance?

This study indicates that as organizations in contemporary Financial Service environments experience competing demands and conflicting pressures, and consequently differentiate their Information Governance system, the need for integrating decision-making for IT across business and IT stakeholder communities grows. The requisite integration is induced by the greater information-processing demands caused by:

- the differentiation of, and resulting interdependencies and conflicting reference frames between decision-makers and decision-making for IT infrastructure, IT innovation and business applications;
- the uncertainty in strategic context, embedded in the value propositions for operational excellence, collaborative synergy, and moreover, in complex innovation and customer value.

Thus, both the increased complexity of the federal Information Governance model, and the uncertainty created by the value set multiplexity require supplementary horizontal mechanisms for integration. The hierarchy and vertical integration mechanisms alone are unsuitable for meeting the increased information-processing demands of a federal Information Governance model. FSI attend to this requisite integration through the use multiple structural, process and collaborative integration mechanisms

Different mechanisms are used to integrate decision-making for IT. Specifically, integration can be achieved through structural, process and collaborative integration mechanisms. These mechanisms describe a layered portfolio of integration capability (Figure 7.1).

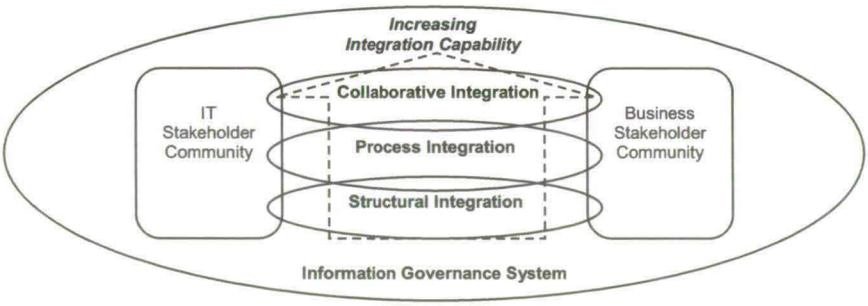

Figure 7.1. Mechanisms for the integration of decision-making for IT across IT and business stakeholder communities.

The results of this study indicate that the use of structural integration mechanisms is the dominant form of Information Governance integration in FSI. These integration mechanisms include direct contact between key stakeholders, project management and project teams, steering committees, and the institutionalization of integrating roles and departments, such as competence centers and program offices. More importantly, however, the case studies indicate that these structural integration mechanisms are a non-differentiating factor in realizing business value from investments in IT.

Whereas structural, process and collaborative integration are necessary, structural integration mechanisms by themselves are insufficient for effectively integration decision-making for IT. Structural integration mechanisms provide the basic infrastructure for integration, upon which decision-making for IT, and conflict-resolution between business and IT management needs to occur. These integration processes are a differentiating factor in realizing business value from investments in IT, and include comprehensive and reciprocally integrated decision-making for IT, and the active resolution of conflicts between business and IT stakeholders through the confrontation of the underlying frames of references between stakeholder communities.

Through active conflict-resolution and participation in decision-making for IT, business and IT stakeholders can develop a shared understanding of each other's main problems, critical issues, objectives, and work towards designing and implementing integrative solutions for reaping the business

benefits of investments and innovations in IT. Governability of IT is a shared quality of business and IT management.

7.3.3 How are the Differentiation and Integration of Information Governance associated with IT Business Value Appropriation?

One of the main lessons learned in this study is that the differentiation of Information Governance (in dynamic and complex Financial Services environment) requires the use of integration mechanisms for business value appropriation from IT. Without these additional horizontal integration mechanisms, IT investments are made in a business vacuum, conflicts remain between stakeholder constituencies, responsibilities are abdicated, and IT and business performance targets remain virtually unattained. The results of this study indicate that business value appropriation from IT in FSI is associated with high levels of both differentiation and integration of decision-making for IT. These high levels of Information Governance differentiation and Information Governance integration are required, and influenced by the demands posed by strategic context, which is characterized by value set multiplexity and uncertainty

Low levels of differentiation in the Information Governance system - IT-centric federal model - involve central and decentral IT managers, who share similar professional backgrounds and work environment, and therefore experience less dissonance in reference frames (Lind & Zmud, 1991; Nelson & Cooprider, 1996; Orlikowski & Gash, 1994; Weill & Broadbent, 1998). Under these circumstances, structural integration may therefore suffice in order to integrate decision-making for IT. With higher levels of differentiation, business managers engage in decision-making for IT, and the differences in goal-orientations and working practices proliferate, and the interdependencies in decision-making for IT increase. In addition, uncertainties stemming forth from the strategic context require additional information-processing capabilities. Consequently, higher levels of integration capability, i.e., process and collaborative integration mechanisms, are necessary for business value appropriation from IT.

The case study results indicate that the following characteristics are associated with business value appropriation from IT[44]:

- Strategic context:
  - Multiple value propositions, with a dominant focus on complex innovation and customer value;

- Business-centric federal Information Governance model:
  - Business management involved in decision-making for IT-business applications;
  - Business and IT management involved in decision-making for IT innovation;
  - Corporate management and IT management involved in decision-making for IT infrastructure and operations;

- Structural, process and collaborative integration capabilities:
  - Ad-hoc and institutionalized team-based structures (necessary, not sufficient);
  - Management forum, or workshops for exchanging and discussing ideas and assumptions (necessary, not sufficient);
  - Cross-training and job-rotation of business and IT managers;
  - Comprehensive decision-making for IT, involving the explication of the business case, the selection and (reciprocal) integration of IT decisions with business decisions, and the strategic monitoring of IT initiatives;
  - Active conflict resolution through confrontation, debate and negotiation;
  - Mutual understanding of business and IT objectives and concerns, and a shared meaning regarding the enabling role and contribution of IT.

[44] Within this sample of purposefully selected companies in the Dutch Financial Service industry.

7.4 Information Governance: Toward A New Organizing Logic ?

The findings and lessons learned in this study hold important implications for both theory and practice of Information Governance. Consistent with the aim of this study, the theoretical and organizational implications are discussed in this section. The implications for theory and theory development are presented in Section 7.4.1, while the implications for organizations and managers are discussed in Section 7.4.2.

7.4.1 Theoretical Implications & Contributions

Ever since computers and communication technologies were introduced in organizations, discussions have flourished on the governance of IT. Over the years, scientists have studied this complex phenomenon, and executives have debated this topic in boardrooms. Yet, despite all the knowledge and experience gained over the past 30 or more years, there is a lack of understanding and empirically-based guidelines regarding Information Governance (Brown, 1997; Brown & Magill, 1998). Weill & Broadbent (1998) report that many organizations struggle with a multitude of business and technical decisions, working on an optimal balance of capabilities at different organizational levels. Sambamurthy & Zmud (2000) conclude that there are increasing signs that the accumulated wisdom from the past decades is inadequate in shaping appropriate insights for contemporary and future Information Governance designs. Moreover, they state that there is a considerable gap growing between scholarly research and contemporary practice, and call for 'a new frame' for examining the organizing logic for the governance of IT.

What then are the implications and contributions of this study for developing and extending theory on the organizing logic of Information Governance? And is there a new organizing logic?

To comprehend and value the implications and contributions of this study, a brief recapitulation of previous studies is presented (see also Section 7.2). Previous studies on Information Governance focused on the locus of IT decision-making authority, and the differentiation of decision-making for IT. The cumulative of these studies reported that a centralized model for Information Governance is associated with small, functionally-structured organizations, following a cost-leadership strategy. A decentralized model for Information Governance is associated with large, market-structured organizations, following a differentiation strategy.

By the early 1990s, a federal model for Information Governance was proclaimed the dominant and best model in organizations. This federal model described a hybrid model for Information Governance, i.e., the centralization and decentralization of decision-making for IT. Yet, while the cumulative of previous studies have contributed to our understanding of Information Governance, the logic and complexity of this federal model for Information Governance remained concealed. Why do organizations adopt a federal model? And what specific type of federal model for Information Governance is adopted?

Furthermore, previous IS studies did not address the integration of decision-making for IT. While previous studies address the division and locus of IT decision-making, they fail to take into account the requisite coordination to accomplish activities. Federal models of Information Governance introduce a 'new division', in which the decision-making actions of individual units are interdependent, thus requiring coordination, especially considering the dynamic task environments, and the different reference frames between stakeholder constituencies. Organization studies have recently also called for the need to learn more about what combinations of decision-making structures and integration mechanisms are most effective in contemporary organizations (Galbraith et al., 1993; Hill et al., 1992; Hitt et al., 1998; Lawler, 1996; Mohrman, 1993; Nadler & Tushman, 1998).

Comparing the existing body of knowledge and theory regarding Information Governance, with the results of this study, the following implications and contributions can be distinguished. First of all, regarding the strategic context and value propositions, this study indicates that organizations are not following singular competitive strategies geared at either a cost leadership or differentiation. Contrary to the predictions and prescriptions by Porter (1980), and the findings of previous IS studies on Information Governance, this study indicates that contemporary organizations operating in complex and dynamic IT-intensive environments are adopting multiple value propositions for meeting competing demands of operational excellence, product/service innovation, and customer value. Organizations need to meet competing demands for (a) continuously delivering customized, high

quality products and services, (b) compressing costs and time, to market products efficiently and quickly, and (c) developing and sharing expertise and other knowledge-based resources.

Contemporary organizations do not have single goals, and face multiple, often conflicting, contingencies. The 'low-cost versus differentiation' dichotomy is fallacious, as organizations are effectively pursuing both strategies simultaneously, in order to meet the competing demands of, and influence competitive market spaces (Weill & Vitale, 2001; Miller, 1979, 1987, 1988; Miller & Friesen, 1978; Khadwalla, 1976; Buenger et al., 1996; Quinn & Rohrbaugh, 1983; Quinn et al., 2000; Treacy & Wiersema, 1993, 1995; D'Aveni, 1994). The focus on either a cost leadership or a differentiation strategy has shifted towards a hybrid and refined perspective on balancing competing value sets. Treacy & Wiersema (1993) indicate that market leaders excell in *at least* one value discipline, *and* meet a minimum threshold of competence in the other two. Effective organizations focus and channel energy at excelling in a specific dimension of value, and maintain threshold standards on the other dimensions of value (Treacy & Wiersema, 1995). Environmental dynamism requires the ability to explore new opportunities effectively, and exploit existing opportunities efficiently (March, 1991). Organizations continue to exist only if they maintain a balance between flexibility and stability, and thus exploration and exploitation (Weick, 1979).

Likewise, the governance of IT traditionally focused on either efficiency or flexibility, often in a sequential manner, subsequently resulting in the 'pendulum swings' of centralization and decentralization over the past four decades. Currently, IT organizations face the dual demands for (a) delivering customized, high quality IT products and services, and (b) compressing costs, risks and time, in order to meet business needs in an efficient, reliable and effective manner (Allen & Boynton, 1991; Roepke et al., 2000; Weill & Broadbent, 1998). Similar to the value propositions in the strategic context, IT organizations need to adopt multiple value propositions for operational excellence, product innovation, service delivery, and business value. Whereas in the past Information Governance focused on single value propositions, currently it faces competing demands for performing while transforming, i.e., to exploit existing opportunities efficiently, and to explore new opportunities effectively.

The recent emergence and dominance of the federal model for Information Governance in contemporary organizations coincides with the multiplicity of value propositions in business and IT domains. The third implication of this study for theory development on Information Governance relates to the differentiation of decision-making for IT. The federal model is a contingent response to the multiple conflicting contingencies placed on the governance of IT. Conflicting strategic contingencies lead to the differentiation of decision-making for IT. A hybrid Information Governance system is thereby created characterized by both the centralization and decentralization of decision-making for IT. The Information Governance system is differentiated to yield operational excellence and enterprise-wide integration under the centralized control of IT operations, as well as business innovation and responsiveness under the decentralized control business applications and/or IT-based innovation.

Contrary, to the arguments by Earl (2000), Robson (1997), Rockart et al. (1996), and Von Simson (1990) that, regardless of organizational contingencies, the federal model is the best model for contemporary organizations, this study indicates that identifying and understanding the strategic context in contemporary organizations is critical to the design of Information Governance. As the results of this study indicate, the federal model is not always the best model.

This study also contributes to theory development on Information Governance by identifying and validating distinct patterns in the differentiation of decision-making for IT. The federal Information Governance is not a single model, but consists of - at least eight - different patterns for differentiating decision-making for IT. The results of this case study indicate that companies adopt either an IT-centric model or a business-centric model. Both are federal models, with the latter being characterized by the involvement of business management in the decision-making for IT-business applications and/or IT-based innovation.

The fifth theoretical implication and contribution of this study lies in the identification and validation of the requisite need for integrating decision-making for IT in the federal Information Governance model. Consistent with Lawrence & Lorsch (1967; 1969) this study concludes that the 'real' federal Information Governance model is something much more complex than just the patterns of decision-making for IT. If the federal Information Governance model is to capture the realities and complexities

of this new logic for Information Governance, it must refer to, and include systems of organizational variables involving the division of IT decision-making; the integration among business and IT stakeholder constituencies; the types of structural integration devices used, as well as the decision-making processes, and patterns of collaboration within the organization. The main thesis being that the differentiation of decision-making for IT in complex and uncertain environments requires appropriate means for the integration of decision-making for IT.

Regarding the mechanisms for integration, this study indicates that while structural integration mechanisms are necessary, they are insufficient for developing and achieving the requisite integration capability. Instead, the requisite integration capability is determined by process integration and collaborative integration mechanisms, involving comprehensive decision-making, active conflict resolution, active participation, and shared understanding between business and IT stakeholder constituencies.

Rather than being a system of command-and-control, focusing on the locus of IT decision-making authority, this study indicates that effective Information Governance in contemporary organizations is more likely to resemble a network of multiple business-IT collaborative relationships based on competencies and flexibility (Figure 7.2). Information Governance is less about who is hierarchically positioned to be in control, and more about the complementary - business and IT - competencies an organization possess, and how it can integrate these, in order to develop the required strategic flexibility for realizing and sustaining business value from IT in a complex and dynamic environment.

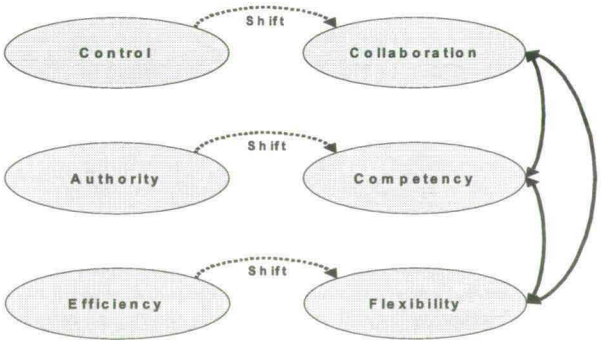

Figure 7.2. Transition in the organizing logic for Information Governance.

The transition in the organizing logic for Information Governance underscores and reaffirms the importance of organic management systems in complex and uncertain environments (Burns & Stalker, 1961). The organizing logic for Information Governance is characterized by a collaborative network structure, where communication is more likely to be lateral, task definitions are more fluid and flexible - related to competencies and skills, rather than being a function of position in the organization -, and where influencing of business-IT decisions is based on expertise rather than an individual (or group's) position in the hierarchy.

In collaborative relationships between business and IT stakeholder constituencies, managers work together to understand business and IT competencies, opportunities, risks and benefits. This collaborative relationship demands that both business and IT managers take responsibility for business operations and IT innovation, which is achievable only when stakeholder constituencies share their unique expertise and competencies. Ross et al. (1996) argues that in a valuable relationship asset, IT and business management share the risk and responsibility for the effective application and utilization of IT in the organization. This organizing logic of Information Governance is based upon a 'collaboration philosophy', also echoed by Parker et al. (1997), who conclude that the new integrating principles include shared values and shared mental models, supporting shared meaning and knowledge, which provides a basis for shared understanding of the value propositions, and a shared commitment to the realization of the value propositions.

7.4.2 Organizational Implications & Contributions

The science and study of Information Systems (IS) is the examination of phenomena associated with the organization, management, development, use and impact of IT. Similar to the fields of Medicine, Law, Engineering, Organization and Management, the field of IS is an applied discipline, rather than solely a 'pure' discipline (Benbasat & Zmud, 1999; Easterby-Smith, 1991; Davenport & Markus, 1999; Keen, 1991; Lee, 1999). Consequently, the field of IS has two objectives (Moody, 2000; Swanborn, 1987): (a) to increase knowledge and understanding of why and how phenomena transpire in reality, and (b) to improve practices by providing answers to specific questions related to action, performance, or other social and organizational needs. While the first objective was discussed in the foregoing section (Section 7.4.1), this section addresses the organizational implications and contribution of this study in terms of the applicability of this knowledge to the design of Information Governance (Figure 7.3).

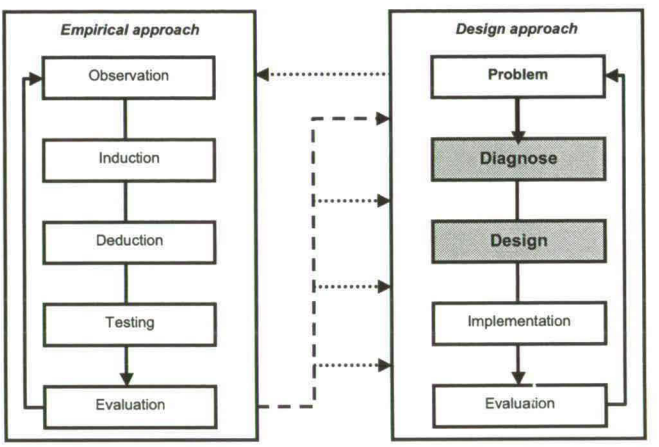

Figure 7.3. Organizational implications and contributions of theory-development on Information Governance.

Information Governance is an organization design problem *par excellence*. The effective resolution of design problems, however, requires a sound diagnosis of the problem at hand. Empirical and anecdotal studies indicate that the design of Information Governance - often couched in the 'centralization versus decentralization debate' remains a perennial item on the strategic agenda of organizations. The question is often heard: "Should we centralize or decentralize our IT department?" Companies often report that they decentralized IT, and recentralized IT two or three years later.

The results of this study should prompt organizations to consider at least four aspects when discussing the design of Information Governance. First of all, IT is not a single homogenous function, but consists of several IT functions and applications, including IT operations, IT innovation, and the business application of IT in products, processes and services. Therefore, the question is not one of centralizing or decentralizing IT, but considering what aspect of the IT portfolio is being centralized and/or decentralized.

Secondly, the centralization or decentralization of functions within the IT portfolio should be contingent upon the characteristics of the organizational - business and IT - context: What are our current and intended value propositions? How is our company governed and structured? What are the major innovations our business is experiencing? These are critical questions that need to be answered before a company embarks on yet another Information Governance redesign. Too often, organizations follow the latest fad, and in the case of Information Governance, this has been the federal model, which has been proclaimed as the 'best of both worlds' (Von Simson, 1990). Yet, as this study indicates, the federal can also lead to the 'worst of both worlds'.

Thirdly, when considering the adoption of a federal model, i.e., centralizing decision-making for IT infrastructure and operations, and decentralizing decision-making for IT innovation and IT applications, organizations should assess what specific type of federal Information Governance model they are implementing. If organizations are already operating under a federal Information Governance model, managers may wish to assess whether they are utilizing an IT-centric or business-centric model, and whether this model is consistent with the dominant value propositions.

Finally, and most importantly, the design of Information Governance goes beyond the differentiation of decision-making for IT. Effective design of Information Governance includes the integration of decision-making for IT. The implementation and utilization of integration mechanisms are essential to the effective design and functioning of Information Governance. Traditionally, integration mechanisms have not been included in the diagnosis and (re-) design of Information Governance. If they are included, it is often in the form of appointing a CIO or program manager, organizing an executive meeting, implementing a steering committee, or designing a project team or project office. However, as the results of this study indicate:

- Structural integration mechanisms are a necessary, yet insufficient condition for effectively integrating decision-making for IT;
- Infrastructural, process and collaborative integration mechanisms are viable and important design strategies for Information Governance integration.

Regarding the differentiation and integration of decision-making for IT in complex, dynamic and IT-intensive environments, the results of this study provide the following strategies and tactics for designing Information Governance:

- Business-centric federal Information Governance model:
  - Business management involved in decision-making for IT-business applications;
  - Business and IT management involved in decision-making for IT innovation;
  - Corporate management and IT management involved in decision-making for IT infrastructure and operations;

- Structural, process and collaborative integration capabilities:
  - Ad-hoc and institutionalized team-based structures (necessary, not sufficient);
  - Management forum, or workshops for exchanging and discussing ideas and assumptions (necessary, not sufficient);
  - Cross-training and job-rotation of business and IT managers (competency development);
  - Comprehensive decision-making for IT, involving the explication of the business case, the selection and (reciprocal) integration of IT decisions with business decisions, and the strategic monitoring of IT initiatives, and business impacts and benefits;
  - Active conflict resolution through confrontation, debate and negotiation;
  - Mutual understanding of business and IT objectives and concerns, and a shared meaning regarding the role and contribution of IT.

The different schemes described and used in this study can be used to assess and diagnose the strategic context, design and strategic outcome of Information Governance (see e.g., Figures 4.2, 4.3, 4.10; Tables 4.1, 4.2, 4.3; Chapter 5). Table 7.2 provides an example of a simple scheme that can be utilized in a self-assessment of the integration mechanisms and integration capability of Information Governance in the organization. The scheme provides a list of structural, process and collaborative integration devices, and can be used to diagnose the implementation and utilization of different types of integration mechanisms. This simplified scheme provides an instrument for managers to re-examine their current integration capability, and identify the strengths, weaknesses, opportunities and threats in their Information Governance model.

Table 7.2. Quick Scan of Integration Mechanisms and Integration Capability for Information Governance.

Integration	Capability	Mechanisms	Implemented?	Utilized?
STRUCTURAL	Static / Low			
		Direct contact Liaison role/Account Manager/Relationship Manager Task force/Project team Steering/Executive committee Integrating function/Program manager/Project Office/Competence Center Cross-training Job-rotation Performance rewards Co-location Communication infrastructure		
PROCESS				
		Decision making comprehensiveness: - Business case formulation - Business impact analysis - Strategic monitoring Decision Making Integration: - Non - Administrative - Sequential - Reciprocal Conflict resolution: - Confrontation - Joint-problem solving - Smoothing-over - Avoidance		
COLLABORATIVE	Dynamic / High			
		Stakeholder participation: - Corporate Management - Corporate IT Management - Business Management - BU IT Management Shared understanding: - Business management understands IT objectives - IT management understanding business objectives		

A more comprehensive diagnosis of Information Governance could also involve an assessment of the strategic context, the differentiation and integration of decision-making for IT, and performance of IT and business (Figure 7.6). The examination of the strategic context would identify the dominant value propositions, and the goals, measures and initiatives underway to realize these value propositions. An assessment of the strategic context would also identify the key stakeholders involved and their main interests, motives, and objectives. An assessment of the differentiation of decision-making for IT would provide a description of the main stakeholders and their role and responsibilities with regard to business processes, business-IT applications, IT innovation, IT delivery and IT operations. This would provide insight into the intended and realized Information Governance differentiation and the IT-/Business-centricity of the Information Governance model. The results could then be compared to the examination of the strategic context.

Following the examination of the strategic context and the differentiation of decision-making for IT, a diagnosis of the integration mechanisms and integration capability could be conducted. The scheme presented in Table 7.3 could be used for this purpose. The assessment of Information Governance integration would yield insights into the type of integration mechanisms used, and the current level of integration capability. A comparative analysis with the strategic context and Information Governance differentiation would provide additional information on the appropriateness of integration mechanisms and the integration capability.

In the final phase of the Information Governance diagnostic, the levels of IT and business performance would be assessed. The measures, initiatives, and achievements regarding IT operations, IT delivery, business impact and business value would be examined. The level of IT business value appropriation

would be determined as well as the linkage with the value proposition measures, and the design of Information Governance.

The use of this 'Information Governance diagnostic' would require multiple interviews with business and IT managers, and could be complemented with the additional analysis of company documents and plans. The results of the 'Information Governance diagnostic' would be reported and discussed in an executive forum or management workshop.

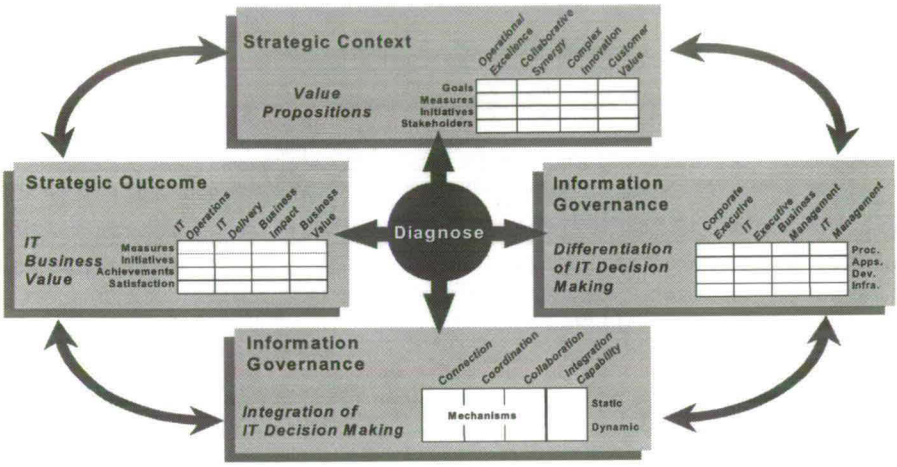

Figure 7.6. Information Governance Diagnostic Model (Peterson, 2001).

7.5 Future Research on Information Governance

The conclusions drawn in this study should be interpreted with the boundaries of this study. This study was conducted within a single industry, and is based on six case studies. The statistical generalization of the conclusions is therefore not possible (restricted external validity), nor was this the intention at the start of this study. The results of this study should therefore motivate future research on Information Governance.

Future research should, first of all, attempt to replicate this study in different organizational domains (see Figure 7.7). Conducting multiple case studies in organizations in other industries, such as, e.g., Manufacturing, Health Care, Telecommunications, and Chemicals would provide valuable insights into the effective design of Information Governance in different contexts. Interesting research questions are: What are the dominant value propositions in Manufacturing or Health Care organizations, and how are they differentiating and integrating decision-making for IT?

Preliminary studies indicate that Manufacturing and Health Care organizations are also experiencing competing demands for operational excellence, product innovation and customer value, and are adopting federal Information Governance models (El Sawy et al., 1999; Peterson & De Wit, 1999). In-depth research in these settings would provide insight as to what types of (business-centric or IT-centric) federal Information Governance models are being adopted, what the underlying value logic is, and what the impact is on IT business value appropriation. The conceptual framework developed in this study, and the instruments used for collecting and analyzing data could be readily applied.

A multiple case study research design could also be extended with the collection and analysis of longitudinal data. Interesting research questions are: How does Information Governance develop and evolve over time under the influence of a changing business landscape? How does IT business value appropriation impact the design of Information Governance? A longitudinal study of Information Governance would require 'closing the loop' in the conceptual framework (see Figure 7.7).

A survey across a large sample of organizations would also provide valuable understanding. Such a study could be conducted within the Financial Services and other industries in order to assess the external validity of the conceptual framework. The survey would require a quantitative operationalization of the constructs and measures used in this study, and the development of a questionnaire. The survey results would be used to empirically test the framework and the underlying propositions. Statistical analysis would provide information regarding the strength of the different relationships in the conceptual framework. Alternatively, this survey could be conducted internationally, or in a pan-European context.

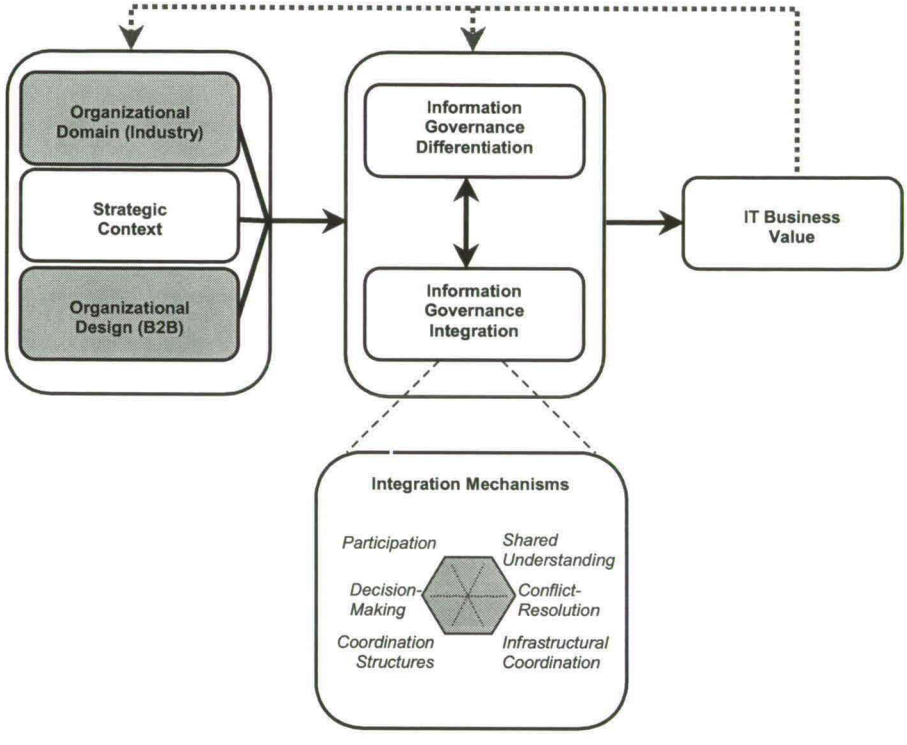

Figure 7.7. Directions for Future Research on Information Governance.

This study was conducted at an organizational unit of analysis. Interesting questions for future research are: How is Information Governance designed in business-to-business constellations? What types of coordination mechanisms are used to integrate IT decision-making between stakeholder constituencies across inter-organizational boundaries? Given the proliferation of electronic business environments and (anecdotal) reports of 'Integration goes B2B' (Michel, 2000), 'Business-to-Business integration (B2Bi)' (Dan et al., 2001), 'Collaborative Commerce' (Anderson, 2001), and 'Collaboration lets companies cut inventory, lower transport costs, and speed reaction time' (Waltner, 2001), these research questions are particularly relevant for future empirical research.

At the individual unit of analysis, interesting questions for future research are: What are the critical leadership capabilities for leveraging IT in electronic business environments? What is the role of shared IT leadership in Information Governance? How are task- and relationship orientations balanced in IT leadership? Studies indicate that a new breed of IT leadership capabilities is required (Earl, 2000; Hartman & Sifonis, 2000; Rockart, 2000; Ross & Feeny, 2000; Sambamurthy & Zmud, 2000; Willcocks & Sykes, 2000). The results of this study indicate that Information Governance is transitioning toward an organizing logic based on collaboration, competency and flexibility.

Information Governance is a shared quality of both business and IT executives, and should therefore not be abdicated to the CIO or IT organization. The results suggest that executives are focusing less on task-control, and more on relationship-building. Understanding what type of shared leadership is emerging in contemporary electronic business environments holds important implications for both theory and practice.

The case studies yield ample evidence that different types of mechanisms are used to integrate decision-making for IT (see Figure 7.7), in order to develop the required integration capability. More empirical research is, however, needed in this area, particularly regarding the interrelationships between structural, process and collaborative integration. How do structural and process integration mechanisms affect collaborative integration? Specifically, what is the role and impact of conflict-resolution in IT decision-making between business and IT stakeholder constituencies?

Previous studies have been predominantly focused on the coordination structures, decision-making processes and participation of stakeholders in decision-making for IT. The results of this study indicate, however, that infrastructural coordination (cross-training, job-rotation), conflict-resolution (confrontation, joint problem-solving) and mutual understanding of business and IT objectives by business and IT managers are critical factors in developing the requisite integration capability. These factors remain a void in empirical research on Information Governance. Gaining insight into these processes is essential for understanding and implementing the transition towards the new organizing logic for Information Governance.

In summary, the results of this study should definitely stimulate further scientific and organizational discussions regarding the organizing logic of Information Governance in contemporary organizations, and motivate future research for better understanding the challenges and specifying the strategies in designing Information Governance. The new reference frame for examining the logic of Information Governance should focus on identifying, understanding, and developing integration capabilities (rather than control structures) based on collaboration, competency, and flexibility. This will require flexibility, competency and collaboration, on the part of both academic and business communities.

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Summary

Information Governance describes the differentiation and integration of decision-making for IT, in order to provide direction to, and realize business value from IT. While previous studies focus on the configurations for allocating IT decision-making authority - classically couched as the 'centralization vs. decentralization' debate -, empirical research has not addressed the hybrid complexity and required integration mechanisms for Information Governance. This study aims to enrich and expand the conceptualization of Information Governance by exploring and explaining the design logic of Information Governance in contemporary IT-intensive business environments. Specifically, the objectives are to analyze the diversity of hybrid configurations and required integration mechanisms for Information Governance, and examine the impact of Information Governance on IT business value realization.

Building forth on organization theory, particularly the contingency theory as set forth by Paul Lawrence & Jay Lorsch (1967, 1969), a conceptual framework is developed. The conceptual framework proposes several relationships between the strategic context, the design, and the effectiveness of Information Governance. In order to validate the framework, multiple case studies are conducted in the Financial Services industry. Specifically, research is conducted in six large, complex Financial Service Institutions, operating in a pan-European market space. Multiple interviews are conducted with business and IT executives, and company documents are analyzed. The data is triangulated and analyzed for patterns of similarities and differences among high and low performing companies.

The findings indicate that companies adopt multi-focused strategies, consisting of a competing value mix of operational excellence, collaborative synergy, complex innovation and customer value. The case studies explain how and why these companies differentiate their Information Governance design in order to realize their mix of competing value propositions, and how and why this multiplexity requires the utilization of integration mechanisms for realizing business value from IT. Organizations are characterized by either a hybrid IT-centric, or hybrid business-centric model for Information Governance. High performance organizations include a business-centric Information Governance model, i.e., business management plays a strategic and influential role in decision-making for IT.

With regard to integration, the results reveal that structural integration mechanisms (management teams, steering committees, CIO, account managers) are not a distinguishing feature of effective Information Governance. In contrast, process integration mechanisms (IT decision-making comprehensiveness and stakeholder conflict-resolution) and collaborative integration mechanisms (active business-IT involvement and business-IT shared understanding) are associated with business value appropriation from IT. Contrary to previous claims, adopting a hybrid Information Governance model, and employing (only) structural integration mechanisms are insufficient means for realizing business value from IT.

The case study findings provide support for the conceptual framework and underlying propositions that differentiation and integration of Information Governance are influenced by the multiplexity of strategic context, and high levels of differentiation need to be matched by suitable integration mechanisms in order to realize business value from IT. In essence, a strategic context characterized by both complexity and uncertainty, requires both high differentiation and high integration of decision-making for IT, in order to realize business value from IT. Moreover, the results of this study suggest that the design logic of Information Governance in contemporary IT-intensive business environments is based, not on the locus of control and command, but on developing collaborative relationships and business competencies.

Summary (in Dutch)

Information Governance beschrijft de coördinatie van besluitvorming rond informatietechnologie (IT). In de literatuur wordt dit onderwerp veelal geassocieerd met discussies en onderzoek naar de (voor- en nadelen van) centralisatie of decentralisatie van besluitvorming rond IT. Onderzoek wijst uit dat organisaties tegenwoordig een hybride structuur hebben waarin de besluitvorming rond IT zowel centraal als decentraal plaatsvindt. In een hybride structuur wordt de besluitvorming rond IT infrastructuur en netwerken centraal belegd en is de besluitvorming omtrent IT applicaties en innovatie decentraal georganiseerd.

Voorgaande studies behandelen echter niet de complexiteit en noodzakelijke integratie van besluitvorming rond IT ten gevolge van een gedifferentieerde hybride structuur. Het onderhavige onderzoek richt zich op het uitbreiden van de theorie en het concept Information Governance middels exploratief onderzoek naar de ontwerplogica van Information Governance in informatie-intensieve organisaties. De centrale doelstelling is het analyseren van de differentiatie en integratie van Information Governance, en het doorlichten van het effect van Information Governance op de toegevoegde waarde van IT.

In navolging van organisatie- en contingentietheorieën, in het bijzonder het werk van Paul Lawrence en Jay Lorsch (1967, 1969), is een conceptueel raamwerk ontwikkeld waarin de relaties tussen de strategische context, het ontwerp en de effectiviteit van Information Governance worden beschreven. Het raamwerk beschrijft middels proposities de relatie tussen de organisatiestrategie en het ontwerp van Information Governance enerzijds, en anderzijds de relatie tussen het ontwerp en effectiviteit van Information Governance.

Casestudies zijn in zes grote complexe financiële instellingen verricht ter validatie van het raamwerk. Alle organisaties zijn gevestigd in Nederland en kenmerken zich door een hybride structuur voor Information Governance. Het gebruik van een gemeenschappelijk analytisch raamwerk en interview protocol maakt het mogelijk verschillen en overeenkomsten te identificeren tussen de casestudies. Diverse interviews zijn gehouden met meerdere bedrijfsleiders en IT managers per casestudie, en bedrijfsdocumenten zijn geanalyseerd.

Uit de bevindingen blijkt dat organisaties meervoudige concurrentiestrategieën volgen voor operationele effectiviteit, synergie, innovatie en klantwaarde. De casestudies verklaren hoe en waarom organisaties een gedifferentieerd model voor Information Governance implementeren, en waarom integratie een pre is voor het realiseren van toegevoegde waarde met IT. De resultaten wijzen bovendien uit dat structurele integratie mechanismen (commissies, stuurgroepen, CIO, account managers) geen differentiërende factor zijn voor effectief Information Governance. Daarentegen blijken procesintegratie (analytische besluitvorming en conflicthantering) en collaboratie (participatie en complementair begrip) wel differentiërende factoren te zijn voor het realiseren van toegevoegde waarde met IT.

Het onderzoek toont aan dat effectief Information Governance gekenmerkt wordt door zowel een hoge mate van differentiatie als integratie van besluitvorming rond IT. De differentiatie en integratie van Information Governance wordt beïnvloed door complexiteit en onzekerheid van de strategische context. In essentie dienen de integratie mechanismen afgestemd te worden op de mate van differentiatie in de hybride structuur voor het realiseren van toegevoegde waarde met IT. Tenslotte blijkt uit de bevindingen dat de ontwerplogica van Information Governance niet primair beïnvloed wordt door het toewijzen van besluitvormingsbevoegdheden, maar door het ontwikkelen van strategische samenwerkingsrelaties en complementaire competenties tussen organisatie- en IT managers.

Appendix A

Research approaches and dichotomies (Adapted from Fitzgerald & Howcroft, 1998; Myers, 1999).

'SOFT' RESEARCH APPROACH	LEVEL	'HARD' RESEARCH APPROACH
	Ontology	
Relativist Multiple realities exist as subjective constructions of the mind. Rooted in social sciences		*Realist* External world consists of pre-existing, tangible structures that exist independently of an individual's cognition. Rooted in natural sciences
	Epistemology	
Interpretivist Understand and interpret from the frame of reference of research. No universal truth		*Positivist* Belief that the world conforms to fixed laws of causation
Subjectivism Research findings emerge from the interaction between researcher and research situation. The values and beliefs of the researcher are central mediators		*Objectivist* The researcher remains detached from the research situation. Neutral observation of reality must take place in the absence of any contaminating values or biases on the part of the researcher.
	Design Methodology	
Qualitative Determining what exist, rather than how many there are. Thick description and theoretical sampling. Focus on complexity of human sense-making		*Quantitative* Use of mathematics and statistical techniques to identify facts. Large samples are more representative. Definition of variables
Exploratory Concerned with discovering patterns in data and to understand/explain them. Generation of hypotheses.		*Confirmatory* Concerned with hypothesis testing and theory verification/falsification
Induction Begins with specific instances that are used to arrive at overall generalizations that can be expected on the balance of probability. New evidence may cause conclusions to be revised.		*Deduction* Uses general results to ascribe properties to specific instances. An argument is valid if it is impossible for the conclusions to be false if the premises are true
Field Emphasis on realism of context in natural situation, but precision in control of variables and behavior measurement cannot be achieved		*Laboratory* Precise measurement and control of variables, at the expense of naturalness of situation
Idiographic Individual centered perspective which uses naturalistic contexts and qualitative methods to recognize unique experience of the subject		*Nomothetic* Group-centered perspective using controlled environments and quantitative methods to establish general laws
	Axiology	
Relevance Validity of actual research question and its relevance in practice is emphasized, rather than constraining the focus to that researchable by 'rigorous' methods		*Rigor* Research characterized by hypothetico-deductive testing according to the positivist paradigm, with emphasis on internal validity through tight experimental control and quantitative techniques

Appendix B

Studies on Information Governance (1980 - 1989)

Authors	Context Variable	Information Governance Design	Research Design	Significant Findings
Olson & Chervany, 1980	Size: - employees Overall firm structure: - centralization of authority - standardization - formalization - line control - functional specialization - perceived power of IS function	3 categories: - highly centralized - highly decentralized - mid-point 3 IT functions: - systems operations - systems development - systems management	- 43 companies (US) - >500 employees - Range of industry, - Survey IT managers	- No significant relationships* *Weak relationship between formalization and formal control over system development and operations, and decentralization overall. *Decentralized decision-making authority associated with formal liaisons to improve to improve communication business and IS personnel - No differences by industry and size
Ein-Dor & Segev, 1982	Size: - revenues - employees Overall firm structure: - centralization of decision-making - psychological climate towards IS - time frame for planning	3 categories: - centralized - decentralized - combined 2 IT functions: - systems development - hardware deployment/ operations (- rank of IS director)	- 53 companies - Range of industry and size - IS reliability (controlled, not operationalized) - Interview IS directors	- Positive relationship between centralization of decision-making and centralization of IT functions - Negative relationship between organizational size and centralization of IT functions - Positive relationship between centralization of decision-making and rank of IS director
Ahituv, Neumann & Zviran 1989	Size: - employees Overall firm structure: - formal structure - locus of decision-making/management style Industry	3 categories: - centralized - decentralized - distributed 1 IT function: - hardware distribution/operations	- 303 Companies (Israel) - Survey IS executives	- Positive relationship between centralization of decision-making and centralization of IT function (dominant) - No differences by size and industry
Tavakolian, 1989	Competitive business strategy: - defender - prospector - analyzer	1 category: - degree of centralization of IT responsibility 3 IT functions: - IT operations - IT development - IT administration	- 52 companies (US) - >500 - Computer industry - Survey IT/Business managers - IS success (controlled, not operationalized)	- Positive relationship between defender strategy and centralization of IT functions

Appendix C

Studies on Information Governance (1989 - 1999)

Authors	Context Variable	Information Governance Design	Research Design	Significant Findings
Feeny et al. 1989	Overall corporate structure: - organization structure - management control system - organizational culture Strategic impact of IT IT heritage Technology assimilation	5 categories: - centralized - decentralized - federal (- business unit) (- business venture) IS functions: - system development - system operations IS performance: - efficiency (IS) - effectiveness (business)	- 13 companies (Europe) - >500 - Interviews IS & business executives	Positive relationship between: - centralized organization/functional structure and centralized design - decentralized organization/ holding and decentralized design - matrix/ multidivisional organization and federal design (dominant)
Hodgkinson, 1996	Strategic management style: - Strategic planning style (highly centralized) - Financial control style (highly decentralized)	2 federal categories: - 'Weak' federal (reactive management style) - 'Strong' federal (proactive management style) IT functions - system operations - system development - IT management	- 8 companies (UK) - >500 - Survey, Interviews - General manager, IT director	- Positive relationship between strategic planning style and 'strong' federal IT governance - Positive relationship between financial control style and 'weak' federal IT governance
Brown & Magill, 1994	Overall corporate organization (e.g. corporate strategy, firm structure) IS organization (e.g. IS budget, Size) IT investment (e.g. economies of scale) External environment (e.g. turbulent/stable)	3 categories: - centralized - decentralized - hybrid - Split (centralized for some business units, decentralized for others) IT functions: - management of technology - management of use of technology	- 6 companies, pair-wise (US) - >500 - Interviews and questionnaires - IS/Non-IS participants	Positive relationships between: - decentralized organization and decentralized design - unrelated diversification and decentralized design - IT management expertise and decentralized design Deficiencies and dissatisfaction with IS cause change in design
Brown, 1997	Business organization: - locus of decision-making - business unit autonomy - competitive strategy - industry stability - workgroup interdependence - information intensity of products/services IT capabilities Attitudes toward change (culture)	1 category: - hybrid IT development governance: centralized and decentralized IT function: - IT development	- 1 manufacturing company; 4 SBUs (US) - Centralized IS operations (controlled) - >500 - Interviews and questionnaires - longitudinal design - IS/non-IS participants	Positive relationships between decentralized IT development governance and: - decentralization of decision-making - business unit autonomy - differentiation strategy - industry instability - high information-intensity Deficiencies in IT capabilities and high emphasis on change lead to 'customized' IT governance
Sambamurthy & Zmud, 1999	Corporate governance: centralized/ decentralized Size (sales revenues) Economies of scope: - diversification mode - diversification breadth - exploitation strategy for scope economies Line IT knowledge (division level)	3 categories: - centralized - decentralized - federal IT functions: - IT infrastructure management - IT use management - IT project management	- 8 companies (US) - >500 - Interviews - Senior IS/CIO - secondary data analysis (1989)	Positive relationships between decentralized IT governance and: - decentralized corporate governance - acquisition/merger strategy - low market relatedness Deficiencies in line IT knowledge and IT asset consolidation strategy associated with 'customized' IT governance

Appendix D

Characteristics of systems theory

- New supplies of energy, called inputs, are brought into the system by the general environment. The general environment includes markets, suppliers, regulatory bodies, competitors, and technological conditions that create demands, constraints and opportunities for organizations. Inputs vary in levels of complexity - variety and interrelatedness of inputs - and uncertainty - variability and unpredictability of inputs -. Inputs can take the form of resources - employees, technology, capital, information, history - stage of development, heritage, past experiences -, and strategy - strategic intent and goals.
- Transformation or throughput describes how the work and work-flows are conducted in the system and by the subsystems, particularly in light of its strategy. The inputs are altered, as the physical or informational materials are processed through the primary business processes in the operating core. The instruments used in the operating core to transform the inputs into outputs are referred as the technical system of the organization.
- The resulting output that emerges from the transformation process is used or consumed by (elements of) the environment. In addition to the basic outputs, i.e., products and services, output also describes the organization's performance in meeting goals.
- Systems have the ability to be self-regulating. Homeostatic processes perform this function, i.e., negative feedback to correct any deviation from what is considered desirable or standard. Not only do organizations have the potential to use feedback for self-correction - primary loop -, organizations use feedback to change standards - secondary loop -. The ability to change standards - dynamic homeostasis -, describes the ability to grow and learn;
- Open systems maintain themselves by importing energy from their external environment to try to offset entropy. Entropy refers to the natural tendency for systems to run down. In order to remain viable, organizations will need to sustain performance achievements;
- Internal control mechanisms of a system must be at least as diverse and complex as the environment. A system can only have complete regulation of its own state if it has a variety of control measures that matches the variety of possible disturbances.
- Organizations develop subsystems to cope with the complexity and uncertainty in the external environment. As organizations grow, special functions and specialists are added to deal with opportunities and problems presented by the informational requirements of the task environment. By virtue of specialization, information enters an organization at different specific points, thereby influencing the goals of sub-functions. In order to achieve organization goals, sub-functions and their respective sub-goals, need to be coordinated and integrated.
- The principle of equifinality states there are different means to the same ends. Organizations have degrees of freedom to arrange and structure activities, and there is no one best way of organizing. Equifinality implies that strategic choice or flexibility is available to the organization, when creating designs to achieve high performance. Different strategies and structures can lead to equal (effective or ineffective) results.
- The capacity of a system to evolve and adapt to new circumstances depends on its ability to move to new levels of differentiation and integration, consistent with the law of requisite variety. Mature systems are more differentiated and integrated.
- Social systems are organized in a hierarchical manner. Systems are composed of multiple -nearly decomposable- subsystems, and on their turn systems are contained in a supra system. The subsystems are only loosely coupled to other subsystems and are capable of fairly autonomous actions, thereby increasing adaptability and flexibility of the system as a whole.
- The hierarchical and loosely coupled nature of social systems implies that organizations are characterized by different degrees of interdependency and connections. Connections within system components are tighter than between system components.

Appendix E

Structural Integration Mechanisms

Organization theory and previous IS studies discuss different direct and indirect structural integration mechanisms. These mechanisms are usually presented in the form of a continuum of integration mechanisms of increasing information processes capabilities and costs. The structural integration mechanisms range from incidental, temporary to relatively stable and permanent means of horizontal coordination[45]. As the integration mechanisms become institutionalized, the costs and information processing capabilities of coordination increase (Galbraith, 1973; Lawrence & Lorsch, 1967, 1969). Galbraith (1994), however, argues that these costs are an investment in integration capability and future organizational performance.

Direct contact describes the scheduled or unscheduled bi-lateral interaction between managers to resolve decision-making problems (Lawrence & Lorsch, 1969). Direct contact includes both pre-planned meetings and ad-hoc interactions between managers across organizational functions, and prevents upward referral through the hierarchy (Galbraith, 1973). Direct contacts are also used as personal modes of influence and coalition building in decision-making (Cyert & March, 1963; Daft, 1998). Media of direct contact include face-to-face meetings, written memos, and the use of communication technologies, including electronic communication systems such as telephone/-fax, e-mail, videoconferencing and group support systems (Daft & Lengel, 1984; DeSantis & Jackson, 1994). Previous IS studies indicate that executive - CEO and CIO - behaviors often include direct personal means of coordination in order to discuss IT agendas and resolve conflicts between business and IT managers (Dutta, 1996; Elam et al., 1988; Feeny et al., 1992; Luftman & Brier, 1999).

When a considerable amount of contact is necessary to coordinate decision-making, a *liaison position* is formally established to channel communication between interdependent decision-making units, thereby bypassing hierarchical coordination (Galbraith, 1973; Mintzberg, 1979). Liaison roles are located in single decision-making unit, but are responsible for communicating and achieving coordination with other decision-making units. The liaison position, however, carries no formal decision-making authority (Galbraith, 1973), and is based on hybrid expertise of, and the ability to communicate with both decision-making units (Mintzberg, 1979). In contemporary organizations, liaison roles are assigned to account managers, relationship managers or customer managers (Galbraith, 1994).

Previous IS studies indicate that account and relationships managers manage accounts of business units by partnering with their business clients in anticipating strategic opportunities for IT applications and by serving as the business' primary point of contact with the IT organization (Clark et al., 1997; Cross et al., 1997). Elam et al. (1988) suggest that liaison roles and account managers can be staffed be either IT or business personnel, and serve as a means through which absent perspectives and experiences and can be communicated and embedded in both IT and business decision-making units. Nambisan et al. (1999) indicate that relationship managers provide personal help to users in identifying and evolving new IT application ideas. Ross et al. (1996) conclude that the use of account managers and relationship managers aid IT managers to develop an improved understanding of business needs, and aid in proactive - versus reactive - behavior by IT managers.

Direct contact and liaison roles often only connect two decision-making units (Daft, 1998). When connections involve multiple stakeholders or decision-making units, a *task force* is required. A task force is a temporary group that is given a delimited problem to solve. Once the problem is solved, the task force is dissolved (Mintzberg, 1979). Task forces range from specialized groups of managers responsible for resolving specific decision-making problems - e.g. the impact of e-commerce on the company's operations, or recommendations for a new IT infrastructure (Hartman & Sifonis, 2000; Weill & Broadbent, 1998) -, to committees or executive councils responsible for long-term decision-making, including steering committees, project committees and IT management councils (Elam et al., 1988). Whereas task forces are temporary systems created to solve nonrecurring decision-making

[45] Although matrix organizations consisting of dual authority structures have traditionally been advocated for achieving horizontal coordination (Galbraith, 1973; Mintzberg, 1979), recently Daft (1998) and Galbraith (1994) argue that a matrix organization is a structural *design option*, rather than a specific structural *integration* mechanism.

problems, project teams are groupings of personnel across decision-making units that carry on some portion of maintenance or innovation processes (Scott, 1998).

Steering committees are the most common structural integration mechanism reported in IS literature (Applegate et al., 1999; Drury, 1984; Elam et al., 1988; Nambisan et al., 1999; Weill & Broadbent, 1998; Zmud, 1984). Steering committees can take the form of temporary task forces - e.g. project steering committees -, or can alternatively be institutionalized as an overlay structure in the organization in the form executive or IT management councils (Elam et al., 1988). Furthermore, steering committees vary in the degree to which they have an advisory function or have formal decision-making authority (Drury, 1984). Advisory steering committees are also referred to as advisory, review or guidance committees (Drury, 1984; Elam et al., 1988). Contrary to specialized task forces, steering committees and advisory boards bring together different stakeholders on a relatively permanent basis for resolving - Business/IT - decision-making questions and problems (Elam et al., 1988; Mintzberg, 1979). Steering committees are also referred to as executive team structures (Galbraith, 1994).

When a full-time position or department is created with the sole purpose of coordinating decision-making, an *integrating function* is designed in the organization (Daft, 1998; Lawrence & Lorsch, 1967; 1969). An integrating function is a position or department with an 'integrator role' superimposed on the existing decision-making structure. Integrating functions carry different titles and take on different forms, including, project managers, program managers, unit managers, design centers and expertise centers (Daft, 1998; Galbraith, 1973, 1994; Mintzberg, 1979; Lawrence & Lorsch, 1967, 1969; Olson et al., 1995). Unlike liaison positions, the integrating function does not report to one of the functional departments being coordinated. In stead, effective integrating functions often report to general management, and are characterized by an intermediate - non-partisan - position between the decision-making units that require coordination (Galbraith, 1973; Daft, 1998; Lawrence & Lorsch, 1967).

Integrating functions vary to the extent that they have formal decision-making authority. Galbraith (1973) lists four stages in the extension of decisional making by the integrating function[46]:

1. The integrating function has no formal authority to impose decisions. The integrating function relies on influence based on expertise, persuasion, negotiation and the ability to facilitate and encourage joint decision-making and conflict resolution (Lawrence & Lorsch, 1967; Mintzberg, 1979);
2. The integrating function receives approval power of budgets formulated in the units to be integrated. Completed decisions are approved and budgets are reviewed. Authority again is largely exercised in the form of negotiation and expertise, rather that rank or hierarchical position (Mintzberg, 1979);
3. The integrating function initiates and legitimizes the decision-making process, including e.g., planning and budgeting. The 'integrator' enters the decision-making process in an early stage and designates and allocates resources, which are then approved by the different decision-making units. Negotiation and persuasion are still important, yet the integrating function gains considerable formal authority due to the initiating role (Galbraith, 1973; Mintzberg, 1979);
4. The integrating function is given complete control over the decision process when it determines the budget and pays the units for the use of their resources. Eventually, this leads to a self-organizing decision-making unit based on formal decision-making authority (Mintzberg, 1979).

Previous IS studies report an increase in the use of integrating functions in the form of project and program managers, particularly in the case of large-scale IT-induced business change programs (Blanton et al., 1992; Brown, 2000; Luftman & Brier, 1999; Sambamurthy & Zmud, 1999; Willcocks et al., 1997). The use of design and expertise centers - 'centers of excellence' - have also been reported in IS literature (Applegate et al., 1999; Clark et al., 1997; Cross et al., 1997; Ross et al., 1996; Weill & Broadbent, 1998). Design and expertise centers pool knowledge from different functional areas and focus on developing organizationally valued - business and IT - skill sets, including e.g., project management, system development, and e-commerce innovation (Hartman & Sifonis, 2000; Marchand et al., 2000; Weill & Broadbent, 1998). Expertise centers are also used for career developing purposes (Applegate et al., 1999).

[46] Galbraith (1973) refers to the latter three integration functions as 'managerial linking roles'.

Whereas the foregoing integration mechanisms describe structural devices for achieving direct horizontal coordination, the following integration mechanisms describe structural devices for achieving horizontal coordination in an *indirect* manner (Table 4.2). Galbraith (1994) refers to mechanisms of indirect structural integration as 'professional networks'. The indirect mechanisms are arranged according to time span, and range from temporary to relatively permanent arrangements (Galbraith, 1994). It should be noted, however, that permanent arrangements are relatively more static than temporary arrangements (Hitt et al., 1998), and are, in general, also more costly (Galbraith, 1994). A reciprocal relationship exists between direct and indirect structural integration mechanisms. Indirect structural mechanisms support the direct structural mechanisms, direct structural mechanisms are dependent upon, and influence indirect structural integration mechanisms (Galbraith & Lawler, 1993).

Galbraith & Lawler (1993) indicate that effective performance in horizontally integrated organizational systems is critically dependent on the ability to work in cross-functional constituencies, be part of multi-perspective decision-making processes, and communicate effectively across disciplines and boundaries. This can be achieved through *cross-training* and *job-rotation* (Galbraith & Lawler, 1993; Galbraith, 1994; Hitt et al., 1998). Both devices are essentially human-resource/expertise-development mechanisms that focus on developing a systemic understanding of the organization, thereby facilitating direct structural integration (Galbraith & Lawler, 1993; Hitt et al., 1998).

Cross-training describes the education and development of expertise and skills in a different professional domain, compared to the extant working environment or professional background training (Galbraith & Lawler, 1993). Cross-training includes attending both formal educational training -e.g. MBA in IT management or business economics-, as well as, informal educational meetings -e.g. IT or business conferences. Liedtka et al. (1997) state that cross-training facilitates the development of 'T-shaped' skills, i.e., a rich depth of technical expertise in one area, coupled with the ability to link that work with other areas. Hitt et al. (1998) indicate that with cross-training in different functions, cognitive models and decision frames can be adjusted and augmented, and is particularly relevant between business and technical functions. Although somewhat dissimilar to Mintzberg's (1979) standardization of skills, cross-training does provide for a higher order of standardization of cross-functional skill sets. According to Galbraith (1994) cross-training facilitates the development of informal networks and personal relationships, particularly when managers with diverse professional backgrounds jointly attend an educational program.

Whereas the use and importance of cross-training between business and IT functions is propagated and acknowledged in IS literature (Applegate et al., 1999; Elam et al., 1988; Henderson, 1990; Luftman & Brier, 1999; Rockart et al., 1996; Willcocks et al., 1997), empirical research is scant. Based on a two-year study of effective IT management practices, Ross et al (1996) provide tentative evidence for the important role of cross-training as part of the required 'human assets' for developing long-term competitiveness. Ross et al. (1996) also mention the use and relevance of cross functional job transfers within and between business and IT functions in order to establish close working relationships and facilitate coordination between business and IT managers.

Cross-functional job transfers or *job-rotation* describe the transfer or rotation of managers across different functions within and across departmental, functional and business unit boundaries. Galbraith (1977; 1994) indicates that job rotation promotes management-development, career pathing, and builds a network of relationships for the individual and the organization. As such, job-rotation has a secondary effect of increasing staff motivation (Hitt et al., 1998). As an indirect coordination mechanism, job-rotation increases the amount and quality of cross-functional communication (Galbraith, 1994; Hitt et al., 1998). Daft (1998) states the advantage of job rotation is that members become submerged in the values, attitudes, problems and goals of other organizational and decision-making units, thereby enabling more accurate and efficient exchange of information and perspectives.

Previous IS studies indicate that job-rotation improve communication and network relationships among business and IT managers (Brown, 2000; Luftman & Brier, 1999; Ross et al., 1996; Weill & Broadbent, 1998). Managers with inter-functional and inter-business unit experience are more likely to establish reciprocal working and personal relationships, and learn to influence without the use of formal authority (Galbraith, 1994). Job rotation involves both temporary assignments - 6 to 12 months - , as well as, long-term job transfers spanning over 2 years (Galbraith & Lawler, 1993).

The use of cross-training and job-rotation are, however, dependent upon the type and use of *performance measurement* and *reward systems* (Galbraith, 1994; Galbraith & Lawler, 1993; Hitt et al., 1998). Galbraith (1994) indicates that rewarding individual behavior in stead of group behavior and performance inhibits the effective use of cross-training and job-rotation for developing integration capability. Individual task-oriented reward and compensation systems penalize cross-training and job-rotation mechanisms. Instead, skill-based compensation systems (Galbraith, 1994) and the reward of coordinated behaviors promote inter-functional and inter-business unit integration (Hitt et al., 1998; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970)

The probability that coordination and collaboration will be achieved between managers is partly a function of their proximity (Kahn & McDonough, 1997). Physical *co-location* stimulates interaction and coordinated actions, and affects the ability to achieve integration (Galbraith & Lawler, 1993; Hitt et al., 1998). Direct structural mechanisms often require closer proximity of those for whom coordination are required. Co-location can be temporary and timed with periods of intense communication between functional and business units (Galbraith & Lawler, 1993). Previous IS studies, though limited, also describe the use of co-location of business and IT constituencies. Ross et al. (1996) describe the co-location of IT account managers and IT system development groups in business client units, while Brown (2000) reports the co-location of IT managers with system development responsibilities to business operating units in order to 'blend in with the customer organization'.

Physical proximity barriers, however, can be overcome through the adoption and use of IT networks and *communication infrastructures* (Applegate et al., 1999; Brown, 2000; Daft, 1998; DeSanctis & Jackson, 1994; Galbraith, 1994; Galbraith & Lawler, 1993; Hitt et al., 1998). In contrast to the foregoing mechanisms depicting social networks, communication infrastructures describe a technical network of information system facilities. Galbraith & Lawler (1993) argue that as sophisticated and advanced communication technology infrastructures interconnect business functions and decision-making units, the traditional conceptualization of direct structural integration mechanisms becomes obsolete. Communication infrastructures have the potential to enable rapid and responsive decision-making and communication across time and space dimensions[47] (DeSanctis & Jackson, 1994; Weill & Broadbent, 1998). Communication infrastructures by themselves, however, are insufficient for achieving integration; they need to be supplemented by direct structural and process integration mechanisms (Galbraith, 1994).

DeSanctis & Jackson (1994) and O'Brien (1996) present the following continuum, ranging from simple to complex IT systems, for shaping the communication infrastructure:

- Document sharing systems can facilitate the sending and receipt of written, audio and video files;
- Electronic mail, bulletin boards and conferencing systems can facilitate structural and procedural coordination of decision-making;
- Electronic meeting systems, - e.g. group decision support systems, collaborative work systems - can support idea generation, idea evaluation, choice making and document preparation in decision-making;
- Shared discussion databases can support issue analysis and the rich dialogue associated with discussing the complex problem situations. Shared discussion databases often include document handling, electronic mail, conferencing and group decision support capabilities.

As an indirect structural integration mechanism, the communication infrastructure is often used in combination with other direct and indirect structural integration mechanisms, including cross-functional management teams and co-location (Galbraith & Lawler, 1993). Moreover, the communication infrastructure facilitates direct and indirect process integration mechanisms (Galbraith, 1994).

[47] Note that the communication infrastructure is used here for purposes of decision-making and coordination, not operational business processes.

Appendix F

Process Integration Mechanisms

Process integration mechanisms for Information Governance are defined as the specification, integration and evaluation of strategic business decisions regarding IT (Henderson & Lentz, 1994; Weill & Broadbent, 1998). Process integration describes (a) the identification and formulation of the business case or 'business rationale' for IT decisions, and (b) the prioritization, selection and evaluation of IT decisions (Parker & Benson, 1988; Luftman & Brier, 1999; Sabherwal & King, 1995; Willcocks, 1996). Similar to structural integration, process integration is a multifaceted construct. Process integration mechanisms envelop strategic decision-making and strategic conversations (Lorsch & Lawrence, 1970; Van der Heijden, 1996). Whereas the former concerns direct process integration, the latter is concerned with indirect process integration.

Strategic decisions are those decisions that commit significant resources and set important precedents for sub-decisions, and the future competitive position of the organization (Mintzberg, 1978; Eisenhardt & Zbaracki, 1992). Strategic decisions are non-routine, interdependent, and politically-laden decisions made by managers in 'upper echelons', and are characterized by relatively high uncertainty, complexity and ambiguity (Dean et al., 1991; Dean & Sharfman, 1996; Eisenhardt, 1989; Eisenhardt & Zbaracki, 1992; Gorry & Scott Morton, 1971). As such, they are different from tactical and operational decision-making. Mason & Mitroff (1981) state that strategic decisions are characterized by their interconnectedness with other decisional problems, complexity with recursive feedback, uncertainty in a dynamic environment, ambiguity dependent upon viewpoint, and conflicting trade-offs, and competing stakes associated with alternative solutions.

Strategic conversations involve exploring and debating ideas and issues in depth prior to decision-making or outside the pressure of immediate decision-making (DeSanctis & Jackson, 1994; Van der Heijden, 1996). Strategic conversations incorporate a wide range of initially unstructured perspectives and views, and involve rich dialogues and communication to reduce equivocality and ambiguity (Daft & Lengel, 1984). Strategic conversations are often not directly goal-oriented, yet provide an information-rich context for strategic decision-making, and are either horizontally or vertically oriented or both (Daft & Lengel, 1984; DeSanctis & Jackson, 1994). Examples include, e.g., debating the strengths and weaknesses of IT standardization policy alternatives, discussing how to experiment with novel business technologies such as electronic business and electronic commerce, or the impact of a new electronic network organization. Debate and argumentation involve processes of (a) making information and its underlying assumptions explicit, (b) raising questions regarding different positions taken, (c) gathering and presenting evidence, and (d) building arguments for and against each possible position that can be taken (Mason & Mitroff, 1981; Nonaka & Takeuchi, 1995).

Organizational Model of Decision-making

Process integration mechanisms for Information Governance are conceptually rooted in an organizational model of strategic decision-making. Dewey (1933) describes the organizational model of strategic decision-making as a problem structuring/-solving process. Based on Simon (1961), Daft (1998) defines the organizational model of strategic decision-making as the process of identifying and solving problems[48]. Previous studies confirm the existence of problem structuring/-solving stages in strategic decision-making, and, subsequently, describe different stage models (Dean & Sharfman, 1996; Huber & McDaniel, 1986; Eisenhardt, 1989; Eisenhardt & Zbaracki, 1992; Mintzberg et al., 1976; Ackerman, 1970; Fahey, 1981; Shrivastava & Grant, 1985). Whereas differences exist between the individual stage models of strategic decision-making, each model describes strategic decision-making as an organizational process of problem structuring and problem solving (Figure 4.14). Furthermore, in each of the stages strategic conversations can transpire. Characteristic of the organizational model of decision-making is the involvement of multiple organizational stakes and stakeholders (Cyert & March, 1963; Daft, 1998; Eisenhardt & Zbaracki, 1992). In the case of organizational decision-making, there is, besides bounded rationality, the additional constraint of conflicting objectives representing the values of different stakeholders (Cyert & March, 1963). Contrary to individual models of decision-making, organizational decision-making - by definition - spans functional and (inter and intra) organizational unit boundaries (Lorsch & Lawrence, 1970).

[48] A problem is defined as the existence of a gap between a desired state and the existing state (Simon, 1961). The decision-making process aims to close or reduce this gap and thereby solve the decision problem.

Problem structuring describes the collection and interpretation of environmental and organizational information to determine if performance is satisfactory and to diagnose the cause of shortcomings (Daft, 1998; Dewey, 1933). It contains 'intelligence' (Simon, 1961) or 'identification' (Mintzberg et al., 1976) activities, and involves gaining a deeper understanding of the problem to be solved. According to Mintzberg et al. (1976) problem structuring involves awareness and recognition in which opportunities, problems and crises evoke decisional activity, the diagnosis of underlying cause-effect relationships, and the specification of decision objectives, i.e., the identification and formulation of performance outcomes to be achieved by a decisions. With respect to IT decision-making, this involves the identification and formulation of the 'business case' for IT decisions (Luftman & Brier, 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998; Willcocks, 1996). In the case of organizational decision-making, involving multiple stakeholders with differentiated interests, goals, and stakes, ambiguity and conflicts arise with regard to decision objectives and decision tactics (Cyert & March, 1963; Daft, 1998; Lawrence & Lorsch, 1967; 1969; Lorsch & Lawrence, 1970; Pettigrew, 1973).

Previous IS studies indeed indicate that strategic decision-making for IT often involves conflicting and competing goals and interests between business and IT management (Boynton et al., 1992; Broadbent & Weill, 1992; Brown, 1997; Peppard & Ward, 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998). Thus, not only is strategic decision-making cognitively constrained (March & Simon, 1958; Simon, 1961), it is also socially constrained due to the influence of various stakeholder constituencies (Cyert & March, 1963; Dean & Sharfman, 1996; Eisenhardt & Zbaracki, 1992; Mintzberg et al., 1976; Pettigrew, 1973).

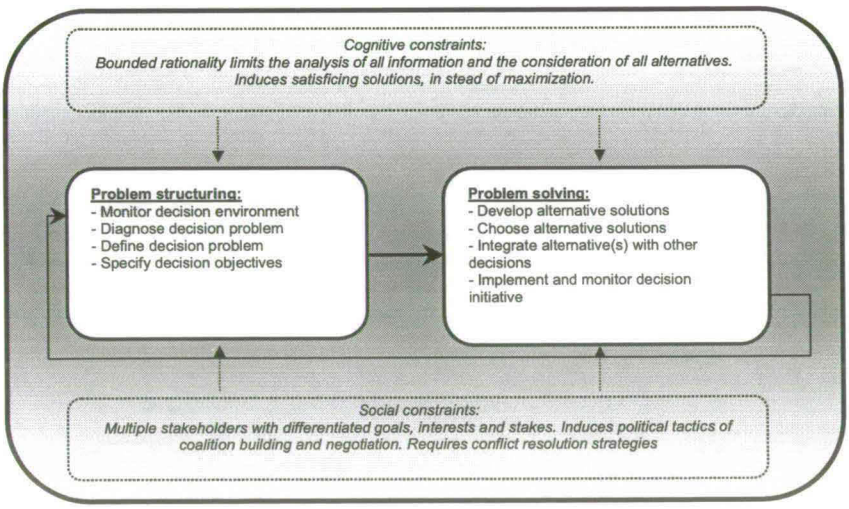

Figure 4.14. Organizational model of decision-making (Based on Cyert & March, 1963; Daft, 1998; Dean & Sharfman, 1996; Eisenhardt & Zbaracki, 1992 Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970; March & Simon, 1958; Mintzberg et al., 1976; Pettigrew, 1973).

Problem solving involves the consideration of alternative courses of action, and the selection and implementation of an appropriate available alternative (Daft, 1998; Dewey, 1933). Problem solving describes 'design' and 'choice' (Simon, 1961), or what Mintzberg et al. (1976) refer to as 'development' and 'selection'. The design activity depicts the analysis, adoption or invention of possible courses of action. This phase consists of a search routine (Cyert & March, 1963) for existing - ready-made - solutions, or the design of new custom-made solutions (Mintzberg et al., 1976). Search begins in local or immediate accessible areas, and is often based on past experiences (Simon, 1961). In the case of a given or custom-made solution, there is no need for explicit choice, as there is only one alternative solution. An alternative is subsequently selected from those appropriate and available. Galbraith (1994) and Eisenhardt (1989) indicate that the assessment of multiple alternatives accelerates decision-making and sharpens preferences due to comparative analysis of decisions.

The selection of alternatives involves the evaluation of decision alternatives and choice making. Thompson (1967) describes a two-by-two contingency matrix describing a typology of decision-making evaluation based on the level of decision-making uncertainty (knowledge of cause-effect relationships) and decision-making equivocality (goal agreement among stakeholders). In situations of high certainty and low equivocality, a rational analytical evaluation process should be used. With high certainty and high equivocality, a bargaining approach should be adopted. In situations of low certainty and low equivocality, an 'evaluation-based-on-judgment' approach should be used, whereas with low certainty and high equivocality, combination of bargaining and judgment would be appropriate. Based on a study of actual managerial actions, Mintzberg et al. (1976) distinguish three approaches: (a) systematic rational analysis along prespecified criteria or value dimensions, (b) judgment based on experience, perception or inspiration, and (c) bargaining between multiple stakeholders, individually employing either systematic analysis or experiential judgment.

Of particular importance in the selection of alternatives is the integration of strategic decisions. Mason & Mitroff (1981) state that strategic decisions are highly interconnected, and making strategic decisions impact and constrain other related strategic decisions. Fredrickson (1984) and Fredrickson & Iaquinto (1989) indicate that the quintessential characteristic of strategic decision-making is the integration of mutually dependent strategic decisions. Eisenhardt (1989) and Galbraith (1994) conclude that the integration of the focal strategic decision with other - previous, current or expected - strategic decisions is pivotal to organizational effectiveness. According to Eisenhardt (1989), integration helps decision makers to cope with the anxiety of strategic 'high-stakes' decision-making, and limits discontinuities between strategic decisions. By interconnecting strategic decisions, managers reduce the delays that occur when executing one decision has unanticipated consequences for other actions (Eisenhardt, 1989).

Previous IS studies indicate that the integration of business and IT decisions are associated with less IT implementation problems and improved organizational performance (Broadbent & Weill, 1993; Chan et al., 1997; Teo & King, 1996, 1997, 1999; Weill & Broadbent, 1998). Based on Thompson (1967) and Van de Ven et al. (1976)[49], Teo & King (1996, 1997, 1999) develop a typology of business-IT decision-making integration[50], involving: (a) administrative integration, in which budgets and schedules are pooled between business and IT; (b) sequential integration, in which business decisions provide directions for IT decision-making; (c) reciprocal integration, in which business and IT decisions are mutually influential; and (d) full integration[51], in which business and IT decisions are made concurrently in the same decision-making process. Whereas administrative and sequential integration depict an 'alignment' perspective of decision-making for IT, reciprocal and full integration describe an 'impact' approach of decision-making for IT (Henderson & Venkatraman, 1993; Parker & Benson, 1988).

In the final stage of problem solving, the decision is implemented and its affects and impacts monitored, thereby cycling back to the problem structuring stage. While traditionally not included in decision-making models (Simon, 1961; Mintzberg et al., 1976), Eisenhardt (1989) indicates that reviewing and monitoring past and present decisions involves 'real-time' operational information, which is critical to strategic decision-making on dynamic environments. Rather than strategic analysis, Eisenhardt (1989) concludes that high-performing[52] organizations in volatile environments track 'real-time' information on organizational operations and the competitive environment, and focus on strategic monitoring of operational performance indicators, rather that accounting data. Strategic monitoring, rather than strategic analysis, also captures more precisely the - conflicting - operational goal achievements of differentiated stakeholder constituencies (Daft, 1998).

Dimensions of Strategic Decision-making

Organizational models that attempt to describe and explain strategic decision-making reflect different conceptions of organizations (Daft, 1998). The 'schools of thought' range from *rational-analytical* models that present the image of an integrated, well coordinated decision-making system, making

[49] Although the Teo & King (1996, 1997, 1999) never explicitly refer to Thompson (1967) and Van de Ven et al. (1976), their terminology leaves little space for a different interpretation.

[50] Teo & King (1996, 1997, 1999) use 'business-IT planning', 'business-IT strategies' and 'business-IT decision-making' interchangeably throughout their writings.

[51] Van de Ven et al. (1976) refer to full integration as a 'team arrangement', in which decision-making is undertaken jointly and simultaneously by unit personnel where there is no temporal lapse of time.

[52] Organizational performance was assessed by measuring sales growth effectiveness and the CEO's self-report of goal-attainment.

reasoned choices from clearly defined objectives, to *social-political* models in which decisions are viewed as an outcome of coalition building and negotiations among decision-making units with competing objectives and conflicting interests (Cyert & March, 1963; Dean & Sharfman, 1996; Eisenhardt & Zbaracki, 1992; Mintzberg et al., 1976).

Whereas traditionally these models have been portrayed as competing, or at opposite ends of a continuum, studies indicates that the dimensions of '*rationality*' and '*politicality*' capture two conceptually and empirically distinct dimensions of strategic decision-making (Allison, 1971; Daft, 1998; Dean et al., 1991; Dean & Sharfman, 1996; Eisenhardt, 1989; Eisenhardt & Zbaracki, 1992; Lorsch & Lawrence, 1970; Mintzberg et al., 1976). Dean et al. (1991) and Dean & Sharfman (1996) indicate that the absence of rationality is not politicality, but non-rationality; and the absence of politicality is not rationality, but non-politicality. Strategic decision can be neither, or politicality and rationality can co-exist. This proposition is also supported by previous IT decision-making studies (Doherty et al., 1999; Sabherwal & King, 1995; Weill & Broadbent, 1998).

Lawrence & Lorsch (1969) and Lorsch & Lawrence (1970) were one of the first to recognize the simultaneous and complementary nature rationality and politicality in strategic decision-making:

> *"We view strategic decision-making as a social process in which conflicting viewpoints and information about the market, technical and economic issues are brought together and discussed until a decision is reached".*
>
> *"Decision-making is a complex process of analyzing information and resolving conflicts".*

Lorsch & Lawrence (1970) describe rationality and politicality as 'patterns of interunit strategic decision-making', i.e., indicators of how managers in interdependent organizational units exchange information, resolve conflicts and make joint decisions. Eisenhardt & Zbaracki (1992) conclude that strategic decision-making is best described as a combination of rationally bounded and social-political insights. Bounded rationality shapes the cognitive limits and the political perspective shapes the social context. Allison (1971) indicates that much of the richness of strategic decision-making studies emanates from the use of competing - politicality and rationality - conceptualizations.

The rational-analytical school views decision-making as a rational and logical process, based on outcome-maximizing choices, in which goals and preferences are consistent across organizational members. Mintzberg et al. (1976) describe decision-making rationality as a process in which alternatives are objectively and carefully evaluated, their factual consequences explicitly determined along goal or value dimensions, and then combined according to some predetermined utility function to maximize utility. Dean & Sharfman (1996) define decision process rationality as the extent to which decision makers collect and analyze information to distinguish among alternatives in terms of their relationship to pre-established organizational objectives, and this process is the basis for choice.

Mintzberg et al. (1976) and Dean & Sharfman (1996) argue that strategic decisions differ in their *degree of* rationality, and that at least moderately rational decision-making is not uncommon. Fredrickson (1984) and Fredrickson & Iaquinto (1989) likewise distinguish between high and low comprehensiveness in strategic decision-making. Comprehensiveness is defined as the extent to which an organization attempts to be exhaustive in making and integrating strategic decisions (Fredrickson, 1984; Fredrickson & Iaquinto, 1989). High comprehensiveness emphasizes the exhaustive analysis of information regarding alternatives, and the formal integration of decisions based on specified rules, procedures and formal methodologies. The organizational logic is that meticulous analysis in each of the sub-stages in the organizational model for decision-making (see Figure 4.14) provides greater knowledge, and thus more effective decisions.

The social-political school describes decision-making as a 'pull' and 'push' between stakeholders, based on negotiation and coalition building, in which multiple ambiguous goals exist (Cyert & March, 1963). Pettigrew (1973) defines the politicality as the involvement of decision-making units in demand and support generating processes with the decision-making processes of the organization. Dean & Sharfman (1996) define politicality as the extent to which a decision involves competition among decision makers for the achievement of sub-unit goals, and the extent to which choice is determined by influence, in stead of hierarchical position. When decision are highly political, influence processes are the chief determinant of the outcome (Lorsch & Lawrence, 1970; Mintzberg et al., 1976; Pettigrew,

1973). Influence processes involve negotiation, lobbying and coalition building (Cyert & March, 1963; Daft, 1998; Lorsch & Lawrence, 1970; Robbins, 1994; Scott, 1998). Politicality may also emphasize the tactics of timing and opportunism, as referred to by Quinn's (1980) 'logical incrementalism'. Quinn (1980) indicate that managers may develop a broad strategy of what they wish, and implement strategic decisions in a series of piecemeal, opportunistic, and experimental actions. This incremental approach allows managers to build a coalition, and to be flexible as the need to change arises (Quinn, 1980).

Whereas the politicality of strategic decision-making is widely acknowledged, its impact on strategic decisions remains controversial. Literature documents 'positive' and 'negative' theories of decision-making politics (Daft, 1998; Eisenhardt & Zbaracki, 1992). Positive theories of decision-making politicality view politics as an endemic and essential characteristic of strategic decision-making. Quinn (1980) argues that creating effective organizational change and adaptation depends upon effective use of political tactics for conflict resolution. Eisenhardt & Zbaracki (1992) contend that politicality can aid in cooperative decision styles by developing coalitions of key stakeholder constituencies. Strassmann (1995) suggests that this is key to the design of Information Governance. Sambamurthy et al. (1993) suggests that politicality permits accommodation of conflicting IT viewpoints through negotiation and mutual adjustment, and results in the development of agreement on plans. Whereas coalition building has a negative connotation, its key characteristic is the development of agreement among different decision-making units regarding problem priorities and problem solutions (Daft, 1998).

In contrast, negative theories of decision-making politicality view politics as ineffective. Politics creates animosity, wastes time, disrupts information channels, and ultimately leads to poor performance (Dean et al., 1991). Markus (1983) and Weill (1992) report that in politically turbulent environments, individuals and groups act in their own interest, and this reduces the likelihood of a uniform commitment to the use and successful exploitation of IT. Weill & Broadbent (1998) conclude that conflict can decrease the adaptability to change, waste resources, and misdirect innovation, thereby reducing the effect of IT on organizational performance.

Lawrence & Lorsch (1969), Eisenhardt & Zbaracki (1992), and Jehn (1997) suggest that the quintessential characteristic of politicality is conflict resolution. Conflict is defined as the perception of goal incompatibility and the interference with goal achievement (Daft, 1998; Robbins, 1994). Conflicts are resolved through the use active and passive resolution strategies. Active conflict resolution involves confrontation and competition strategies, whereas passive conflict resolution involves avoidance and smoothing-over strategies, i.e., latent conflicts remain and are not explicitly resolved (Daft, 1998; Eisenhardt, 1989; Lawrence & Lorsch, 1969; Robbins, 1994; Van de Ven & Ferry, 1980). Confrontation occurs when parties in conflict directly engage one another, and negotiate and try to work out their differences. The confrontation strategy defines a conflict as a mutual problem. Competition or forcing strategies use influence - based on position or expertise - to accept a decision that is satisfactory from only a single partisan perspective. Passive conflict resolution, on the other hand, involves avoidance of conflicts by withdrawing or suppressing the conflict, whereas in smoothing-over managers involved in the conflict agree not to disagree, in the hope that the conflict will wane.

Studies indicate that conflict resolution by confrontation is a more effective means of resolving conflicts in comparison to competition, smoothing over or avoidance (Eisenhardt, 1989; Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970). Confrontation strategies resolve conflicts through the active explication of underlying assumptions regarding decision objectives and alternatives. Benefits have been ascribed to the positive tension that arises from crossing experientially and cognitively different viewpoints. Jehn (1997) indicates that organizations perform more effectively when they experience task-related conflicts stemming from having different perspectives on a problem. Senge (1990) suggests that innovative ideas and practices often arise from the combination of very different viewpoints into a 'creative tension'. Lawrence & Lorsch (1969) and Lorsch & Lawrence (1970) conclude that confrontations increase the likelihood of developing long term collaborative working relationships. The mechanisms of collaborative integration are discussed in the next section (Section 4.5.1.3).

Appendix G

Collaborative Integration Mechanisms

Collaborative integration mechanisms describe the degree of collaboration and mutual understanding between different organizational decision-making units (Lawrence & Lorsch, 1969; Lorsch & Lawrence, 1970). Collaborative integration is defined as the process of joint decision-making among interdependent parties, involving joint ownership of decisions and collective responsibility for outcomes (Gray, 1991). Joint ownership describes the belief in the importance of the collaboration to the organization's success, a sharing of mutual commitment among stakeholders, and a willingness to support group decisions. Ellinger et al. (1999) add to this definition the coming together of diverse interests and people. Thus, although collaborative integration implies joint ownership of decisions and collective responsibility for outcomes, each stakeholder constituency maintains its individual orientation. This is the essence of 'integrated differentiation' or 'diversity in unity' (Lawrence & Lorsch, 1967, 1969).

Collaborative integration refers to a close, functionally interdependent relationship in which organizational units strive to create mutually beneficial outcomes. Henderson (1990) describes this as an - internal, cross-functional - *partnership*[53] that reflects a working relationship of long-term commitment, a sense of mutual collaboration, and shared risks and benefits. Ellinger et al. (1999) indicate that collaborative integration addresses informal behaviors, based on information and expertise sharing, that occur between interdependent organizational units. Thus, contrary to structural and process integration, collaborative integration is a voluntary process that cannot be mandated, programmed, or formalized, and is often intangible and tacitly present in the organization (Ellinger et al., 1999; Gray, 1991; Kahn, 1996; Mintzberg et al., 1997).

Central to collaborative integration is the participative behavior of different stakeholders to clarify differences and solve problems, in order to find integrative solutions (Lorsch & Lawrence, 1970; Robbins, 1994). Liedtka et al. (1997) argue that the capability for inter-functional collaboration allows the organization to find broader solutions. According to Liedtka et al. (1997), collaboration unleashes the creativity involved in joint exploration solutions that transcend technical boundaries and define future possibilities. Gray (1991) and Liedtka et al. (1998) indicate that collaborative integration is characterized by its participative and shared nature. Specifically, collaborative integration addresses the voluntary participation and shared understanding between stakeholders involved in decision-making processes (Kahn, 1996). Participation and shared understanding depict two different aspects of collaborative integration. Whereas participation describes the *direct* and *actual* involvement of stakeholders to influence decision-making, shared understanding describes the *indirect* and *mutual* understanding among stakeholders of each other's objectives (Carter & Cullen, 1984; Kahn, 1996; Lawrence & Lorsch, 1967, 1969; Lorsch & Lawrence, 1970).

Participation

Participation is a process in which influence is exercised and shared among stakeholders, regardless of their formal position or hierarchical level in the organization (Lorsch & Lawrence, 1970; Wagner, 1994). Dyson & Foster (1982) define participation in decision-making as the act of *actively* taking part in the process of decision-making together with other stakeholders. Participative decision-making balances the involvement of stakeholders in information processing, decision-making and problem structuring/-solving. Participative, or collaborative decision-making provides interactions necessary to develop rich interpretations of events and actions (Daft & Lengel, 1984; Scott, 1998). Liedtka et al. (1997) indicates that participative decision-making describes the extent to which the decision-making process gives a 'voice' to relevant stakeholders, and is critical to maintaining commitment of stakeholders.

Participative decision-making varies with the *scope* and *intensity* of stakeholder participation in decision-making (Liedtka et al., 1997; Lorsch & Lawrence, 1970; Wagner, 1994). The scope of participation describes the breadth of stakeholders, or functional specialists, involved in decision-

[53] In fact, different authors equate collaborative integration, or collaboration with the concept of partnerships (Griffin & Hauser, 1996; Kahn, 1996; Liedtka et al., 1997; Mintzberg et al., 1997). However, given the wide-spread use and association of the term 'partnership' with studies on inter-organizational relationships and (IT) outsourcing, and the focus of this study on intra-organizational, inter-functional decision-making, the term 'collaborative integration' is used in this study.

making. Participation intensity describes the depth of stakeholder participation in decision-making, i.e., the number of sub-stages of decision-making (see Figure 4.14: Organizational model of decision-making) in which stakeholders are involved. Thus, participation scope can be 'narrow' in the sense that only corporate IT management and division management are involved in decision-making for IT, or 'wide', describing the additional involvement of senior business executives, business division managers and other business functions (e.g., Marketing, Finance, Human Resource Management). Participation intensity is described as low if only IT units - or business units - predominate in the different sub-stages of decision-making, whereas high intensity describes the mutual participation of different - business and IT - stakeholders throughout the different sub-stages of decision-making, including both problem-structuring and problem-solving.

Previous studies indicate that participation has a positive effect on organizational performance and satisfaction. Cotton et al. (1988) and Wagner (1994) draw this conclusion from a meta-analysis of empirical research on the effects of participation and participative decision-making. Wagner (1994), however, indicates that different forms of participation are associated with different outcomes. High participation scope and intensity was found to be more effective, in comparison to low intensity and low scope participation. Likewise, previous IS studies[54] provide evidence that the involvement of business management in decision-making for IT -high scope and high intensity- is of strategic importance (Boynton et al., 1994; Broadbent & Weill, 1993; Doherty et al., 1999; Dutta, 1996; Garrity, 1963; Jarvenpaa & Ives, 1991; Keen, 1991; Peppard & Ward, 1999; Rockart et al., 1996; Ross et al., 1996; Weill & Broadbent, 1998; Willcocks et al., 1997). Given the interconnectedness and mutual influence of business and IT decisions in strategic decision-making, the collaborative participation of business and IT decision-making units is pivotal to value appropriation from IT. Ross et al. (1996) describe the collaborative participation between business and IT as relationship-specific asset for the effective application of IT, and for developing long-term organizational competitiveness.

Nevertheless, Jarvenpaa & Ives (1991) conclude that few nostrums have been prescribed so religiously, yet ignored as regularly as business executive participation and involvement in decision-making for IT. March & Simon (1958), however, indicate that individuals have a limited span and scope of attention, and 'current local concerns' take precedence over 'general concerns'. If business management perceives IT as a 'non-critical, non-local concern', following March & Simon's (1958) thesis, it is unlikely that business management will get involved in decision-making for IT. Thus, business manager's perceived importance and understanding of IT for business will influence the propensity to actively participate in decision-making for IT. Likewise, IT management's perceived importance and understanding of the business' activities will influence the propensity to actively participate in decision-making for IT. The mutual understanding between business and IT decision-making units is thus an important indirect mechanism for collaborative integration (Henderson, 1990; Keen, 1991; Weill & Broadbent, 1998; Reich & Benbasat, 1996).

Shared Understanding

Different terms have been used to covey the concept of shared understanding, including shared mental models (Parker et al., 1997; Senge, 1990), shared thought worlds (Griffin & Hauser, 1996), shared frames (Orlikowski & Gash, 1994), shared knowledge (Nelson & Cooprider, 1996), and collective minds (Weick & Roberts, 1993). *Shared understanding* is defined as the mutual understanding by members of organizational sub-units of each other's goals and objectives, i.e., a mutual understanding of goal-orientations by different organizational members (Lorsch & Lawrence, 1970). Shared understanding addresses the *congruency* of reference frames of stakeholder constituencies involved in interdependent decision-making (Brockman & Anthony, 1998). March (1988) states that when stakeholders understand the perspectives of other stakeholders in decision-making, they can accurately interpret and anticipate actions, and coordinate adaptively. This is akin to a social-technical paradigm of information systems, in which IT managers need to comprehend the business context in which IT is or will be used (Bostron & Heinen, 1997).

Within the context of Information Governance, shared understanding describes the mutual understanding of business and IT objectives and plans by business and IT executives (Henderson, 1990; Reich & Benbasat, 1996; Weill & Broadbent, 1998). This includes an understanding and appreciation among business and IT executives for the processes and technologies that affect their

[54] Previous studies implicitly assume that IT managers are always - by default - involved in decision-making for IT. Consequently, theoretical and empirical studies have focused on the involvement of business management in decision-making for IT.

mutual performance (Nelson & Cooprider, 1996). Shared understanding between business and IT managers does not address the details of each other's activities and skill bases, but of the other's objectives, concerns and needs (Keen, 1991). Reich & Benbasat (1996) refer to shared understanding as the social dimension of 'linkage', operationally defined as (a) business executive's understanding of IT objectives, and (b) IT executive's understanding of business objectives. Likewise, Parker et al. (1997) indicate that shared understanding should adequately represent business and IT variables:

> *"Business managers must include information needs and the business impact of technology in their mental models for guiding the business. IT managers must include the business management variables in their mental models for effectively deploying IT".*

Shared understanding is formed when people in close collaboration enact a single memory complete with differentiated competencies and responsibilities (Weick & Roberts, 1993). Shared understanding resides in specialized relationships among stakeholders, and in particular, the information flows and decision-making processes that shape their dealings with each other (Lorsch & Lawrence, 1970).

In their study on software development, Crowston & Kamerer (1998) report the following limitations of traditional coordination, and the importance of shared understanding:

> *"After our initial analysis of data from two sites, it seemed that coordination theory did illuminate some of the problems of requirements analysis on large projects, but it provided only one approach to the problems of software development. Better ways for analysts to coordinate were certainly important, but it seemed equally necessary for group members to develop shared understandings of customers' needs and to anticipate what actions would contribute to the process. The key to the successful coordination of the requirements analysis seemed to be that analysts mostly 'just knew' which features were needed, whom they had to consult for advice on which features to pick, and whom to ask to write a specification or check for dependency. The question then became, 'How did they know that?' - a question that coordination theory was not designed to answer".*

Previous IS studies suggest that shared understanding between business and IT constituencies has a positive effect on value appropriation from IT. Crowston & Kammerer (1998) conclude that shared understanding between functionally differentiated sub-units, in a manner that enables each sub-unit to effectively comprehend the objectives and perspectives of the other sub-unit, not only facilitates meaningful dialogue to achieve acceptable resolutions to differences, but also creates a context for more innovative uses of information technology. Nelson & Cooprider (1996) conclude that increasing levels of shared understanding between business and IT management leads to improved IS performance effectiveness. Orlikowski & Gash (1994) indicate that incongruent reference frames provides an interesting explanation of the difficulties and unanticipated outcomes associated with the implementation of IT. Parker et al. (1997) conclude that shared understanding is a new integrating principle for successful IT-enabled business transformations.

Appendix H

Conceptual models of organizational effectiveness:

The *Rational Goal* Model (RG) or rational system model of organizational effectiveness focuses on whether the organization achieves its goals. In the strategy/strategic management literature this is often equated with the achievement of economic goals and financial performance (e.g., market share, profitability). The use and importance of multiple non-financial measures (e.g., customer satisfaction, product innovation, flexibility) is currently, however, widely acknowledged.

The *Systems Resource* Model (SR) provides a framework to assess organizational effectiveness in terms of key internal and external factors (e.g., financial, human, and information resources) upon which the organization depends for survival. Organizational effectiveness is defined as the degree to which the organization effectively obtains scarce and valuable resources necessary for high performance. Budgets and ratios (e.g., IT expenses/total operational expenses, annual IT investments/revenues) are considered 'key indicators', yet other 'intangible assets' are equally important, including, e.g., human capital, knowledge assets.

The *Internal Process* Model (IP) measures effectiveness as the internal organizational health and efficiency, and focuses on the 'smooth internal functioning'. Organizational health describes, e.g., a strong corporate culture and positive work climate, confidence, and team spirit and teamwork. Organizational efficiency refers to the internal business processes, and includes factors such as, efficiency, costs, time, and productivity. Internal organizational health and business processes are considered leading indicators of future (non-) financial business performance.

The *Strategic Constituency* Model (SC) or stakeholder model focuses on the fulfillment of (external and internal) stakeholder needs. External stakeholders include, e.g., customers, suppliers, business partners, whereas internal stakeholders describe, executives, managers, and employees. A stakeholder is any unit (individual, group, or organization) within or outside the organization that has a stake in the organization's performance. Stakeholder satisfaction is the primary indicator and describes whether the organization's inducements are sufficient to evoke contributions from constituencies that are necessary for the organization's continuation. Strategic constituencies have different criteria of organizational effectiveness due to different interests and stakes in organization. These criteria reflect and include indicators described in the foregoing models (i.e., RG, SR, and IP).

The *Competing Values* Model (CV) recognizes that strategic constituencies have different value judgments regarding organizational effectiveness, and explicitly recognizes that these value judgments can be in conflict and competing with one another. The CV model focuses specifically on competing management values in organizations. Similar to the SC model, the CV model includes indicators from RG, SR and IP, e.g., efficiency, training, profitability, and resource acquisition.

The *Balanced Scorecard* Model (BS), similar to the Competing Values model, recognizes that organizations face competing values, and need to balance financial and operational measures. BS supplements financial measures with three non-financial/operational measures: (a) customer orientation, (b) internal business and (c) innovation/learning. These perspectives include elements of the SC (i.e., customer orientation) and the IP (i.e., internal business and innovation/learning) model. Similar to the CV model, the BS model provides an integrative perspective of organizational effectiveness. Contrary to the CV model, yet consistent with the IP model, the BS model describes a hierarchy of 'leading-lagging' measures from innovation/learning and internal business perspectives, towards customer orientation and financial performance, i.e., operational measures are the drivers of future financial performance.

The *High Performing* Model (HP) or benchmarking model of organizational effectiveness compares organizational performance across a sample of organizations operating in similar industries, or under similar conditions. The High Performing model aims to compare the effectiveness of the organization with similar organizations, and involves identifying other organizations (e.g., competitors) that exemplify effective practices in some activity or function, i.e., benchmarking. Results of a narrow benchmark, however, carry the risk of being translated from one organization to another without considering the (change in) organizational contexts.

Appendix I

Interview Protocol

Date:

Name:	**Company:**
Function / Title:	**Years in Function:**
Professional Background:	
Main responsibilities and tasks / Relationship with IT (IT Organization):	

Company Background:

- Organization Structure
- Products / Services / Markets / Customers
- LoB / Divisions / SBU
- Size, Age
- Financial performance

Strategic Context:

- Environment (Business/IT):
  - Changes
  - Trends
  - Challenges
  - Competition:
    - Price, Costs, Quality, Product, Service, Distribution, Customers, Competitors, Suppliers
  - Role of IT

- Mission statement
- Value drivers / Value propositions
  - Operational Excellence
  - Collaborative Synergy
  - Complex Innovation
  - Customer Value

- Strategic Business Plan (section on IT)
- Role of IT
- Achievements / Reasons

- Business goals & objectives
  - What/Why
  - Achievements
  - Documented/Copy
  - Role of IT

- Performance measures/indicators
  - What/Why

- Relation to IT
- IT Impacts/Business Changes
- Business Value (Financial, other)
- Satisfaction:
    - Why / Why not

- IT Strategy/Policy

    - Mission statement of the IT organization
        - Central Theme
        - Value proposition

    - Strategic plan
        - Documented / Section on business
        - Relationship with business strategy
        - IT Investments
            - Innovation & Development
            - Maintenance & Enhancements

    - IT Goals & Objectives
        - What/Why
        - Link with business
        - Documented/Copy
        - Achievements / Reasons
        - Recent projects / programs

    - Performance indicators
        - What/Why
        - Link with business
        - Documented/Copy
        - Measures
            - IT Operations
            - IT Delivery Services
            - Other

    - Satisfaction:
        - Why / Why not

Differentiation of Decision-making for IT

- IT Organization
    - Organization Structure
    - Functions / Divisions / Departments
    - Products & Services
    - Core processes
    - Major organizational developments in the IT organization (last 2/3 years):
    - Main areas of IT Decision-making:
        - Infrastructure
        - Applications
        - Operations
        - Development
        - Maintenance
        - Out-/In-/Co-sourcing
        - Other:

- Decision-making for:

    - Hardware (Annual / Long term): Where? Who? Why?
    - Software (Annual / Long term)
    - Networks (Telecommunication / Intranet / Internet)
    - Technical architecture (Annual / Long term)
    - Standards
    - Services
    - Business-IT Applications (short term / long term)
    - IT Operations/Infrastructure (short term / long term)
    - IT Development/Innovation (short term / long term)
    - Other:

    - Involvement of senior business executives, senior IT executives and business managers and/or IT managers in decision-making for the foregoing IT sub-functions:
        - Who
        - Why
        - How
        - When

    - Satisfaction with locus of decision-making for IT functions
        - Why / Why not

Integration of Decision-making for IT

- Process of Decision-making for IT

    - IT Investment decisions (see sub-functions):
        - Infrastructure
        - Development
        - Applications
        - Other:

    - Decision-making process:
        - Stages of decision-making
        - How

    - Business case (Problem identification / Goal definition), Prioritization, Selection, Integration, Evaluation (Monitoring)
        - How
        - Criteria
        - Explicit
        - Who
        - Documented (Example/Copy)

    - Formalization
        - How / Why
        - Use of specific tools/techniques/methodologies/frameworks, e.g.:
            - SWOT
            - Scenario
            - CSF
            - IE
            - BSC
            - SLA
            - Other:
        - In which stage of decision of decision-making
        - Also utilized by business

- Stakeholders
  - Participation/Involvement (Corporate, Business, IT)
  - Knowledge
  - Attitude towards IT and change

- Collaboration/Relationships Business-IT
  - 'No collaboration required'
  - 'Can't be any worse' / 'Serious problems'
  - 'Good enough'
  - 'Joint efforts'
  - 'Harmonious'

- Conflicts
  - Business / Personal
  - Resolution
    - Formal authority
    - Confrontation
    - Compromise
    - 'No problem'

- Negotiation / Lobbying / Informal
  - 'Backroom discussions'
  - 'The office corridor'
  - Lunch, Coffee breaks
  - 'A day away'

- Changes in decision-making process (over the past 3 years):
  - Organization
  - Formalization
  - Standardization
  - Involvement
  - Collaboration
  - Conflicts
  - Negotiation

- Satisfaction:
  - Why / Why not

- Use of devices for coordinating and integrating decision-making for IT

  - Structures (formal/informal)
    - General
    - New (last 12 months)

  - Processes (formal/informal)
    - General
    - New (last 12 months)

- Use of specific mechanisms:

  - Communication through hierarchy / superior
  - Set goals
  - Appointment of a new position
  - Personal (direct) contact
  - Liaison roles / Account Managers / Relationship Managers
  - Cross-functional groups/teams
  - Project teams
  - Steering Committees / Executive Councils
  - Integrating roles / Designated (Program) Managers

- Integrating cross-functional departments / 'Special office'
- Communication facilities, networks, e-mail, shared databases
- Co-location: geographic, building, level, space, room
- Job rotation: Business-Business, Business-IT, IT-IT
- Rewards/Incentives for performance achievement
- Cross training / Special workshops on Business-IT
- Other:
- Satisfaction:
    - Why / Why not

Additional comments

- Specific topic(s) not addressed
- Major success story
- Greatest challenge

Appendix J

Comments on and changes in the operationalization of constructs

Before pilot study	Excerpt of answers and comments provided by informants	Changes
Business Environment	*"Dealing with the new players in the market is a tough challenge. They have increased the level of competitiveness"* [Senior Executive] *"Customers want more and faster, at lower prices"* [Business Manager] *"We are bundling and cross-selling our products. Customers want a full package solution that addresses all their needs. This poses challenges to our internal organization. It requires working across functional boundaries and integrating our IT systems"* [Senior IT Executive]	No change
Operational Efficiency	*"First of all, operational excellence has always been key in the insurance sector. For us it means focusing on efficiency, the reliability of services, and reducing risks"* [Senior Executive]	***Operational Excellence***
Collaborative Capability	*"We strive to achieve synergy within the company, and between the business units. Two years ago, we started to work on improving the synergy across all of the islands in the organization"* [Senior Executive]	***Collaborative Synergy***
Product Innovation	*"Innovations include more than just products; we have changed our services, processes and structures. This doesn't happen all at once, but innovation contains much more than products"* [Senior IT Executive]	***Complex Innovation***
Market Awareness	*"It is more than just being aware; its about understanding and creating value for the customer"* [Business Manager] *"Satisfying customers and developing customer loyalty is critical to our company"* [Senior Executive]	***Customer Value***
Information Governance Differentiation	*"Infrastructure decision are always made by the IT director and the central IT department. Last year, the central department also started to work on specifying architectural standards"* [IT Manager] *"I am responsible for decisions concerning IT applications, although I get a lot of input from my IT manager"* [Business Manager] *"See part of the problem is not really where these IT decisions are made. I mean, sometimes you have a business manager who is so thickheaded that he doesn't understand that the IT architecture needs to be company-wide. He's wants the best for his department, but from where I stand, I need to meet the demands of all the divisions, not just his department"* [Senior IT Executive]	No change
Information Governance Integration	*"There is a standard process we follow for making strategic decisions regarding IT. First of all, I consult with my IT manager, then I write a proposal to the IT director. The proposal is based on a standard format, and includes the business problem we want to solve, or the business opportunity that we see, the expected business benefits, costs and risks. The proposal is then discussed in a review committee consisting of the IT director, business division managers and IT managers. If the business proposal gets accepted, I need to write a plan. Usually this involves setting up a project and planning for resources"* [Business manager] *"We have different committees and project teams are always used, but what you really want is a awareness creation of the business and IT issues. These aren't really achieved through structure. It's more of a change in the 'organizational mindset' that needs to take place"* [Senior Executive]	No change
Business Performance IT Performance	*"Growth in premium income, and customer satisfaction are critical performance measures. Each year I get reviewed based upon these measures"* [Business Manager] *"IT performance is basically measured by its effectiveness: it needs to meet business functionality, and be delivered on time and within budget. We also need to make sure that our shop is up and running at all times. If we mess up, the business messes up, and customers start complaining"* [Senior IT Executive]	No change

Appendix K - Argos

Strategic Context

The corporate mission of Argos, as described by the mission statement (1998) and the IT strategy plan (1998), is to be a complete insurance provider providing added value to customers. Improving customer value and aligning products with customer needs and markets is the value proposition in Argos. A business executive states that Argos is not solely driven by a profit making mentality, but is directed at providing added value to customers, which in the end determines the success and competitive position in the insurance marketplace. The business strategy is described as providing customer service quality in an optimum cost-quality relation. Customer value is the main business focus, but achieving operational excellence is major business objective. According to business and IT executives, the business strategy is to provide low-cost/high-quality products that are of added value to customers.

Argos is organized into five business units, of which life insurance (consumers) and general insurance (P&C) are its main lines of business. Each business unit is managed by a management team, which is led by a business director. These business directors report directly and regularly to the Board of Directors. The Board of Directors consists of two members who carry overall responsibility for the company and have the highest authority. A staff for policy development regarding communication, information technology and financial control support the Board of Directors.

Argos has a decentralized structure with profit responsibilities at the business unit level. Up until 1993, Argos was a highly centralized organization. In 1994, the company decided to decentralize and reorganize its business processes because of the increasing competitive pressures, lack of flexibility for addressing the rapidly changing marketplace, and the increasing demands of the banking outlets. This reorganization process was successfully completed in 1998. Both financial as well as strategic objectives were achieved. Because of the decentralized structure Argos is able to provide products and services at the lowest cost available and meet their business objectives and the expectation of our customers. Argos has experienced improvements in efficiency and effectiveness, and in this same period there has also been a shift towards more intra-organizational collaboration and networking.

Annually, a strategic plan is developed based upon the different business plans. After considerable deliberation and discussions a mission statement is formulated. The strategic plan and mission statement are then communicated throughout all the business units. Business directors and the Board of Directors meet every month to discuss relevant business and marketplace developments. Business directors have profit responsibility and are held accountable for the business performance. They report regularly to the Board of Directors on the revenues, profits, and the continuity of business development. Business management team meetings take place on a weekly basis. In between these formal meetings, managers meet informally to discuss problems or new developments.

In the last two years, Argos has formalized these planning and control mechanisms and stimulated open communication and collaboration for the benefit of customers. Linked to these planning and control mechanisms is a reward system. Managers get awarded and rewarded for completing successful projects. Management competency and project management skills are considered essential to the success of the business. The training programs for managers in project and program management have been institutionalized throughout the company.

Information Governance Design

The IT vision plan describes the role of IT as being essential for both strategic developments as well as business operations. Business and IT managers describe IT as a life-line, arguing that *"without IT there is no production, no marketing, no decent human resource development, and no added value for our customers*". The awareness of IT as a strategic enabler of business transformation and customer value is shared by both the business and IT, and has increased over the last two years. Continued investments in IT are seen as critical requirements in sustaining a competitive position. Furthermore, Argos is critically dependent upon IT. According to a senior staff member: *"we have linked all our products in the way we deliver our products to customers. And this delivery is pure IT enabled. If there is a hitch in the system we have a major problem"*. This critical dependency is also stated in the IT strategy plan.

The strategic orientation of IT is to enable the business to provide customer service quality at the lowest price possible. IT helps to reduce costs and provides business flexibility. The orientation of IT has shifted from efficiency towards business effectiveness and customer value. IT was primarily a support function prior to 1996. In the last two years IT has increasingly become a key enabler of product innovation and business transformation. This changing role of IT is also reflected throughout the IT strategy plan and investment decisions, in which IT is an integral part of the business strategy development. In the IT strategy plan continuous reference is made towards the strategic objectives and expected developments in the business.

IT strategy development occurs at the business unit level, and strategic business plans are translated to IT project plans. In the different business units, the business director and IT manager develop an IT strategy on which they agree. IT is then integrated with the corporate IT strategy in an IT management forum in which the IT director and IT managers participate. In this IT management forum the different Business IT strategies are discussed and integrated, and subsequently reviewed by the Board of Directors. Congruency and consistency are achieved across the business units and at concern level. For Argos this is particularly relevant when developing architectures, infrastructure and employing standards.

In the last five years, Argos underwent a shift from a centralized to a decentralized IT organization, and has currently recentralized certain IT functions. The business environment and organization are used as a reference point for organizing the IT function. Similar to the business environment, up until 1993 the IT organization was highly centralized and in 1994 the Board of Directors decided to decentralize IT to the different business units. The reasons for this were competitive pressures and the lack of flexibility. Argos had a central EDP department that was responsible and accountable for all IT-related issues in the company.

The decentralization of IT lasted two years, and late 1995 management experienced that business and IT were not in line. There was a high degree of dissatisfaction with the way that IT was managed. There were too many different systems, based on different architectures using different standards, and there was no linkage between the corporate vision, business strategy and IT. Due to decentralization IT was leading too much, in stead of being driven by the business and investments were being wasted. The Board of Directors argued that Argos would need one policy for IT if it wanted to sustain its competitive position.

As a result, in 1996 Argos formed a taskforce that analyzed and assessed the organization and management of IT. The activities of this taskforce resulted in a plan that was accepted and changes were adopted. Recentralizing was necessary because of the large investments in IT, and the use of common standards, architectures and infrastructures. In 1996, Argos started to reorganize its IT function and recentralized certain responsibilities and activities. In 1997, a shared architecture was designed.

In the current IT organization, at top management level, the Board of Directors share the responsibility for IT, of which one member holds IT in his portfolio. A central staff unit for IT is managed by the IT director and has a policy development and control function. The IT director is responsible for IT coordination, IT support, IT security, IT infrastructure and IT change developments. The IT director is also responsible for formulating and evaluating the corporate IT strategy and supports the business directors in the implementation of their business IT strategy. The IT director and IT managers meet weekly in an IT management forum to discuss developments regarding IT. Each business unit has its own IT department that is run by an IT manager who is part of the business unit management team. Business Management is responsible for, and makes decisions regarding division IT applications

According to both business and IT managers *"in the last two years, after many learning experiences, we recentralized the organization and management of IT, and now we have a clear understanding and one policy for IT. Now we do have sufficient parity and I think we finally got a grip on all the shoeboxes and shoestrings"*.

An important mechanism implemented in 1996 in Argos is the training of its business and IT personnel for IT competency development. All IT personnel are required to follow a course on business economics and administration. The formal training and courses are focused on developing business knowledge and social-communication skills, for improving cross-domain knowledge and

language. Business managers are also required to follow courses on information management. Another mechanism currently being employed in Argos for IT competency development is job rotation, in which IT professionals work in different business environments. Professionalization and competency development of both business and IT personnel are regarded has a key (human resource management) factor in the exploitation of IT. Argos has also institutionalized an 'Information Management Forum' as a way of sharing knowledge and experiences on the role of IT within its lines of business.

IT development is governed by a steering group and a project group. The project group consists of the user departments and IT staff and is led by a business project manager. The business director is responsible for the IT project, its progress and performance. The project groups meet on a weekly basis. The steering group, consisting of the IT director and business division managers is responsible for strategic decision-making and making sure the projects is running well. The Board of Directors is involved in the steering committee through monthly updates in a 'meta' steering group with a dash board function.

The Board of Directors, the IT director and the Finance director together with project managers discuss the progress of different projects. These meetings have an assessment function, in which the project leader reports to the steering group. In the dashboard meetings three colors are used to evaluate and monitor IT developments. Green means 'ok', orange means '?', and red means 'bad'. This mechanism is an element of the recentralization and formalization process. The function of the dashboard meeting is to create awareness of the business issues and the way they are being addressed by the IT projects.

At the business-project level, service level agreements and ITIL-instruments are used. Depending upon the IT application, the steering group involves different business directors and other senior members of staff. The IT business projects are discussed in monthly meetings with the Board of Directors in which progress and performance are reviewed and monitored. The IT director, the finance director, the business director, and the IT manager participate in these meetings.

Weekly management team meetings are held with managers from business and IT departments. In this weekly report different projects and their respective problems and performance are discussed. IT is always on the agenda, and the operational issues as well as the strategic business implications are discussed. During these meetings the objectives and performance of both IT and business are discussed and agreements are made. According to the business director "*in the last two years we have developed a culture of open communication, shared understanding, and working together for the benefit of our customers*". Developing commitment is an important task of the business director.

Within the organization there is an explicit focus on the alignment between IT and the business. When formulating the business strategy and defining objectives, and rethinking the organization form, the management team will look for IT opportunities and possibilities, and will set up a business project. The management team looks at customers' needs and assess what new products they want and how the business can improve its position on the market place. Argos follows a standard way of working that follows a consistent path from product positioning, to process redesign, to IT development. IT plans and project proposals are based on business plans and objectives. When discussing IT in management team meetings, the business director uses the motto: *"No nice to have, only must have, design for budget and fitness for use"*. IT projects are monitored and assessed on time control, budget control, functionality and customer satisfaction.

IT projects are business driven and developed in a multidisciplinary manner. Business plans and IT plans are developed in a joint effort by both business and IT managers. The IT plan consists of a project value analysis, assessing the business benefits, a description of the project objectives, resources and management, and a risk analysis. This is a standardized format for developing and submitting IT plans and project proposals to the Board of Directors. Once the business plan and the related IT plan have been developed, all the departments and staff members in the organization must support it. If there is no agreement or consensus, the proposal is not presented to the Board of Directors.

Strategic Outcome

The business value of IT in Argos is measured by looking at the targets set and agreed upon. For each IT project, specific targets are set. Project targets always describe time control, budget control and functionality. Business management indicates that in general IT projects are finished on time and within budget, and always meet business requirement needs. Business and IT management indicate that IT deliveries meet business requirements in over 75% of the time. Critical measures of IT operations include IT availability and responsiveness, both of which are regarded "*very good*" by IT and business management

Business targets describe cost-reduction, innovation in products and services, time-to-market, flexibility to respond to customer needs, and customer satisfaction. On average, business and IT executives rate the business value appropriation from IT with an 8 (on a scale from 1 to 10). As business management indicates: "*There is always room for improvement*". Business and IT management indicate that IT is being successfully exploited to the advantage of the business. More specifically, both business and IT managers identify the following contributions of IT to improved business performance:

- improved IT infrastructure flexibility and services;
- shared business information architecture;
- internal and external business networks;
- increased time-to-market and flexibility;
- improved product/service innovation;
- reduced transaction costs;
- sustained market growth;
- improved customer satisfaction;

Appendix L - Athens

Strategic Context
Athens is a large insurance company of approximately 2600 staff, and distributes its products and services through banking channels. The corporate mission of Athens is to provide customers with state-of-the-art insurance products and services. Its business strategy is to be innovative and a product leader in the Insurance business. Business executives indicate that the development and provision of new insurance products in a time-sensitive and effective manner are key business objectives.

The primary value propositions in Athens are product leadership and operational excellence. According to business management, strategic business objectives include rapid commercialization, improving time-to-market, reducing cycle times, and optimizing business process and efficiencies. Internal company reports describe collaborative synergy and customer value also as important secondary value propositions, recognized in business objectives of customer responsiveness, customer convenience, and the search for functional and business unit collaborations. IT management states that streamlining business processes, and improving business efficiencies are key objectives on the strategic business agenda.

Athens is organized into to three lines of business, represented by three business divisions. Life and non-life are its two main lines of business. The Board of Directors carries overall responsibility for the company, whereas profit and business strategy responsibilities reside within the business divisions. A general director and a management team, consisting of staff specialists in the fields of finance, human resources, communication, IT and general facilities lead each business division. Business division management teams meet every two weeks to discuss on-going operations and new business developments. In between these formal meetings, regular informal encounters occur.

Every year, each business division develops a strategic business plan, containing the major objectives set for the coming three years. This strategic business plan is derived from the corporate business plan, and contains a description of the main business objectives and targets to be achieved. The business-objectives and targets are then often translated into short-term plans and projects, which are discussed and implemented within each business division. As an input to the development of the corporate business plan, business directors and the Board of Directors meet every month to discuss relevant business and marketplace developments.

Information Governance Design
The IT strategy plan describes the role of IT as being essential for realizing the business strategy and supporting business operations, i.e. to be innovative, reduce product-development cycle time, and provide professional services. The strategic orientation of IT is to support the business to provide innovative insurance services in an efficient and effective manner. The IT strategy is derived from business division strategy plans, and discussed and reintegrated at the corporate level. IT management states, however, that *"On paper the link between IT and business strategy seems o.k.; in practice, I think IT and business lead separate lives"*.

The corporate IT office is primarily responsible for attuning and integrating the different division-IT strategies into a consistent corporate IT strategy. The corporate IT director indicates that *"while in theory this seems all very nice, in practice I am confronted with competing demands placed not only by the different business divisions, but also in balancing corporate versus business-specific requirements. In the past, we tended to focus more on the business-specific demands. However, over the past two years* [1997 – 1999] *we have recentralized our IT infrastructure, and are implementing a corporate-wide information architecture"*.

The current IT organization is characterized by a central corporate IT office, and several decentralized IT departments at the business division level. The corporate IT office is led by a corporate IT director, responsible for corporate networking and operations, corporate IT strategy, IT infrastructure, IT security, and corporate-wide IT developments, including Internet and e-commerce. The IT director and IT managers meet every month in a corporate IT committee to discuss technical problems and developments surrounding corporate and divisional IT operations. In 1999, the Corporate IT office also introduced IT workshops for IT managers in order to discuss new developments in, and applications of

IT. Often, external (guest) speakers are invited to present innovative applications of IT in the insurance business.

At the business division level, IT management takes the lead in IT development and innovation projects, and serves as a linking-pin between the corporate IT office and business divisions. Officially (according to corporate documents), however, business division management is responsible for developments and IT innovations in the business. According to the IT director, *"ideally a business director should take the lead, but my experience is that our business directors don't have the knowledge and experience to lead IT projects, and this way I am sure that IT developments are in sync with corporate-wide IT operations and developments"*. The IT director admits that the answer to the question regarding 'who decides what, when, where and how' does lead to unresolved conflicting situations between business and IT managers.

Business management also indicates that the corporate IT office does not want to loose control over IT by giving the divisions decision-making authority over IT. However, business management states that consequently many IT projects fail to meet their business objectives and time-lines. Business management states: *"IT has little feeling for the real business issues. Give an IT manager the responsibility for managing an IT project, and you'll never get any usable solution on time"*.

A division IT manager adds *"In the past, business managers were occasionally involved in IT decision-making, but over the years, they have become less committed due to numerous project and system failures. This has led us to take control over the processes, sometimes by mere default. Business no longer wants to do it, we think they should do it, and in the end, we end up doing it anyway. Why? Well, just to make sure that we don't get blamed again for all of the failures"*.

Structural coordination mechanisms consist of steering committees and project organizations. Steering committees are responsible for the monitoring and control of projects, and generally consists of a business division manager, the project manager and the IT director. The project organization consists of a project leader, which is usually an IT manager. The project leader reports monthly to the steering committee, and project members meet weekly to discuss problems and progress. Project reports address budgets and time-lines. In the case of large system development projects, department managers and IT specialists are temporarily co-located.

Decision-making authority regarding local business-IT applications resides with division IT managers. This includes the maintenance and updates of IT applications used by the business departments within each division. Department managers usually indicate if they are experiencing any problems with their applications, and subsequently the local IT manager decides if, how and when the problem is to be solved. IT management indicates that almost 80% of their time is spent on problem-solving and 'patching-up' applications that are not running well. According to an IT manager, *"we spend so much time on 'fire-control', that we have little time left for addressing any type business application development or innovation. This also means that we usually work over-time, because we also need to manage IT development projects. Solving application problems is our first priority"*.

Business management argues that *"I still experience two ships with two captains. IT still runs its own business without informing me. The task of IT management is inherently linked to the person; some people are just better than others"*. IT management also states *"the IT project leader is still to isolated in the project organization, and many regard it as the sole responsibility of the IT organization, instead of an integral responsibility within the project organization"*.

In a recent [2000] attempt to formalize IT decision-making, the corporate IT office introduced the use of a balanced scorecard and critical success factors methodology for prioritizing and selecting IT projects. The balanced scorecard is used to identify the primary domain of IT contribution, i.e., financial, business operations, customer services and/or business innovation. Following an identification of the primary domain, different specific factors are identified which are critical to the success of the business.

According to the IT director, the motivation for introducing the balanced scorecard was the lack of formalization and standardization of the IT decision-making process. The IT director states that *"traditionally, in a best case scenario, IT decisions were based on a simple cost-benefit analysis. We would focus predominantly on the costs of a project, partly because the corporate IT office has a tight*

budget to manage. In a worst case scenario, decisions regarding new IT developments would just happen, and no one would have a clue what the rationale behind the investments was. It was simply a matter of starting a project, and see where we would end up".

Business management indicates that while in the past IT decisions were indeed made in an ad-hoc fashion, the current situation remains much the same. According to business management, while the corporate IT office speaks of using the balanced scorecard, the real adoption and use of this method has not taken place in the organization. Business management states that this is partly due to the 'unofficial policy' of the corporate IT office of not wanting to relinquish any IT decision-making to the division managers.

Business management also indicates that even when using the balanced scorecard, it is unclear whether there is any added value: *"It already starts in the first stage when there are endless discussions about the primary domain of the of IT contribution; should we be focused on improving our business operations, or innovating our business processes and services. In the end, it all gets down to your relationship with the corporate IT director".* Another business manager states that the introduction of the balanced scorecard is *"just another political move to stay in control, and provide the appearance that we are managing IT more professionally. Ultimately, the corporate IT office still determines what is done, and we just accept it".*

Strategic Outcome

With regard to the performance achievements of IT operations and IT delivery, business management is dissatisfied with the low functionality of systems, and the lack of responsiveness by the IT organization: *"The IT applications are too 'frigid' to meet our demands. When my marketing manager wants to access and query customer data, the system crashes, and it takes an eternity before we get any assistance from IT management. The system functionality is deplorable, partly because IT is always avoiding the real resolution of the problem".*

Business management also states that IT developments take too long, and almost never meet the stated business requirements. Project budgets and time-lines are almost never met, and the functionality provided is mediocre, according to business management. IT management states, however, that it is never exactly clear what the business wants. *"In the midst of development and implementation, they tend to change their requirements and want something else. It's as if they can't make up their mind, or they always want something different".*

The IT director indicates that *"part of the problem with IT development projects is the lack of involvement and input from business management. I introduced the balanced scorecard precisely to address these types of problems, but I rarely receive a formal request or read a sound business case for developing a new system. The business objectives are stated too vague, or they change mid-way a project for us to achieve the targets. We then need to take more time, and eventually spend more resources on the project".*

The IT director states that with regard to the IT network operations, these have improved in the last two years [1998 – 2000]. Corporate IT plans also report that IT infrastructure services have improved. The IT director indicates that due to the recentralization of decision-making authority for corporate networks and IT operations, the availability and reliability of IT services have increased, and is very acceptable at this moment. IT management concurs, and indicates that there has been some efficiency improvement.

Business management argues, however, that *"while there has been some efficiency improvement, and the network is currently operating much better than before, streamlining inter-business processes still remains problematic. The lack of integration of our different applications and systems hinders any type of real business value in the form of improved product innovation and time-to-market. These are strategic business objectives, which according to me, still have not been met".* Business objectives regarding product and service innovation, improved time-to-market, and customization of services go largely unfulfilled. Corporate management agrees and adds, *"organizational innovativeness and business flexibility still need improving".* Stakeholders are relatively dissatisfied with the business value appropriation from IT, and overall, business and IT management rate the business value with a 6.

Appendix M - Corinth

Strategic Context

The corporate mission of Corinth is to collaboratively deliver (retail) insurance and banking products to general and specific customer groups by means of excellent personal services. Its business strategy is to be customer-oriented and innovative, to realize growth in return and market share and provide professional services. According to IT management, achieving operational excellence is a strategic objective of the business. The company's distribution channels, through its network of tied agents, are the main source of competitive advantage and optimization of business processes in terms of efficiency and effectiveness are key business objectives. IT plays a key role in realizing these business objectives and supporting business processes, as described by both strategic business and strategic IT plans.

Corinth is organized into three business sectors, of which life insurance and property & casualty (non-life) insurance are its main business sectors. The Board of Directors consists of five members who carry overall responsibility for the company and have the highest authority. Functional responsibility for the internal organization, finances and IT are collectively designated to an individual member on the Board of Directors. Every year, a mid-term business plan is developed containing the major objectives set for the coming three years. This mid-term plan is based on the corporate plan and is operationalized in a one-year plan. Mid-term business plans are then communicated and coordinated across the business sectors through mutual consultation. Each year mid-term plans are reviewed. The Board of Directors and sector leaders meet once every two months to discuss relevant business and market place developments. Sector leaders and sector staff meet once every three weeks to discuss external and internal sector developments. In between these formal meetings, regular informal personal encounters take place.

According to a senior executive the organizational culture is characterized by "*a family culture of low accountability, uncertainty avoidance, and non-involvement*". In 1998, a major strategic change program was started to reorganize its business processes because of the increasing competitive pressures, lack of flexibility for addressing the rapidly changing marketplace, and lagging sales effectiveness. In order to formalize its planning and control processes, top management adopted a balanced scorecard management approach in 1998. This was part of the strategic change program. Performance indicators were identified and formulated according to the strategic objectives of Corinth. Plans were made for the prioritization and selection of projects (also non-IT) according the balanced scorecard management approach. The Board of Directors indicates that it wants to redirect the company towards a professional, team-based and a result-oriented culture.

Information Governance Design

The IT mid-term plan describes the role of IT as being essential for both strategic developments as well as business operations. The IT mid-term plan is derived from corporate and sector mid-term plans. The IT objectives are defined to support the business strategy, i.e. to be innovative and customer-oriented, to realize growth in market share and provide professional services. IT is of critical importance to the further development and improvement of distribution channels and sales effectiveness. The strategic orientation of IT is to support the business to provide insurance services at the lowest price possible. IT helps to reduce costs and optimize processes.

In 1996, IT management was decentralized to each business sector in the form of a technical support staff for IT applications. The sector Automation is led by an IT sector leader and the corporate IT organization is responsible for systems development, architecture and infrastructure. These functions are organized according to the functional business sectors life insurance, property & casualty, sales force support and general systems. In 1999, the company outsourced the maintenance of its mainframe infrastructure to the IT support staff unit of the financial concern of which the company is part of.

As part of the strategic change program, the IT organization is currently professionalizing its organization and services. The IT professionalization program was started in 1997, and is focused on improving the IT development processes (from CMM -Capability Maturity Model- Level 1- to CMM2 and CMM3), training of system developers in social, communication and consultancy skills, and professionalization of project management and systems development methodologies.

Structural coordination mechanisms consist of a steering committee and a project organization. The steering committee is responsible for the decision-making and control of projects, and generally consists of a business sector leader, the project manager and the IT sector leader. The project organization consists of a project leader, usually an IT manager, and several sub-project managers responsible for user-organization, IT development and implementation. Increasingly project managers are attracted from a central pool of professional project managers from the parent company. The project leader reports monthly to the steering committee and project members meet weekly. Reports address budgets and time-lines.

Prior to the strategic change program initiated in 1998, projects were driven by IT and led by an IT manager. However, the IT organization is taking distance from project management responsibilities and is looking into consulting and decision-implementation tasks. IT management no longer wants to be in control of IT projects and their new role and responsibilities is as yet unclear. The question as to who should take the lead in IT remains unclear, as this is not formally arranged. Business management indicates that "*as a result it is unclear who should take the lead*".

Due to the strategic change program, sector leaders are taking on the responsibility for managing IT projects, and IT projects are more often being led by someone from the business organization. However, although a general agreement on the new responsibilities and accountabilities is expressed, in practice there is not much enthusiasm of business sector leaders to lead projects and take responsibilities. Taking on the responsibility for IT is a tough task, as one business sector leader put it: *"Success has many fathers, but failure is an orphan. So who in his right mind would want to be responsible for IT".*

The Information Governance processes in Corinth describe both demand, as well as supply activities. Prior to 1998, demand and supply were regulated and driven by IT. Business demand and project descriptions were unclear and objectives were not tightly formulated. Project prioritization and selection were not formalized and were based on available budgets and the lowest costs. *"It was more a matter of who could scream the loudest. As projects would progress, new demands and user needs would be communicated to IT and these would then be included. This leads to frustrations and disappointment for both parties and the situation remains unchanged".*

Supply of IT is driven by the business demand to implement a product on a certain date. Systems are often not stable enough to meet this requirement, with lagging functionality, due to a 'quick and dirty' systems development approach. Because of time constraints, certain required steps in the systems development methodology are not made, and unnecessary risks are taken.

Due to these unsatisfactory working conditions and in relation to the strategic change program, 1998 saw a number of changes with regard to the demand and supply of IT within Corinth. Information Governance processes, from business needs specification to IT delivery, were formalized and several tools (checklists and instruments) were implemented. New Information Governance activities have since then, however, been scarcely adopted and remain to be practiced company-wide.

Different stakeholder constituencies participate in the governance of IT. Sector leaders and IT managers are the primary stakeholders involved in Information Governance. However, the involvement of key stakeholders is perceived differently throughout the organization. While sector leaders state that IT managers should show more commitment, IT managers state that business sector leaders should be more actively involved. In the last six months there is a trend where users are getting more involved with IT, and where top-management is getting less involved and delegating more responsibilities to sector leaders. With regard to sector leaders and IT managers, a similar trend is visible were sector leaders are increasingly actively involved in project formulation activities and management activities, and where IT managers are playing a greater role in project implementation activities and support activities.

While key stakeholders recognize the strategic role of IT for realizing their business strategy and supporting their business processes, and the improvement thereof, they have different perceptions of IT objectives in relation to business goals. In general stakeholders share the notion that IT should efficiently and effectively support the 'internal' business processes. However, while corporate and commercial business objectives are known by the business, the IT organization seems to have difficulty articulating these 'external commercial' objectives in relation to IT objectives. The business

organization also has diverging expectations of IT. The business organization advocates improving sales effectiveness and creating customer-value through the use of IT, whereas the IT organization mentions process efficiency as a key objective. A senior business executive explains that these different perceptions are hardly resolved since they remain largely implicit when discussing business cases and project objectives.

Strategic Outcome

In the past, IT was always regarded as 'successful' in Corinth as long as a system was implemented and it was used. Now time, costs and functionality are used as primary measures for assessing the performance of IT on a project to project basis. Except for individual highly successful projects, many IT initiatives fail to meet time, cost and functional requirements. Many IT projects still run over time and budgets limits, and do not meet all the functional requirements. Furthermore, the IT architecture requires updating, but because of many high priority projects and the complexity of systems, systems quality and IT flexibility for developing new products is not possible. Business management indicates down-time of IT operational systems is not uncommon. According to business management *"IT is more of an inhibitor, than an enabler"*.

With regard to business value, IT remains under-exploited in improving time-to-market, maintaining market share and customer satisfaction. New products take too long to reach the market and improving market share remains a priority. Furthermore, while efficiency has increased slightly, business management indicates that in most cases commercial objectives are not achieved. Stakeholders are largely unsatisfied with the performance of IT for added business value. This has led to a negative image of IT in the organization and a low-morale among IT personnel. Responsiveness of the IT organization to business needs is perceived as very low by business management. On average both business and IT managers rate the business value appropriation from IT with a '4' (on a scale from 1 to 10).

Explicit statements of discontent include:

- Business Executive: *"There is no alignment between business and IT"*
- Business Executive: *"No one takes responsibility"*
- Business Executive: *"There is a lack of commitment from both business and IT"*
- Business management: *"There is not enough attention for the user-organization"*
- Business management: *"Too often a 'quick and dirty' systems development methodology is used"*
- Business management: *"There are no clear business objectives or business cases"*
- Business management: *"There is a lack of prioritization and performance tracking, and there is no post-implementation evaluation"*
- Business management: *"The quality of IT is a disgrace"*
- Business management: *"Projects are always over time and over budget. That's a fact of life here"*.
- IT management: *"It seems as if there is no business policy with regard to IT"*
- IT executive: *"There is no clear structure and too many ad-hoc activities are carried out and tolerated"*
- IT management: *"There is a growing lack of capacity (quantity and quality)"*

Appendix N - Harma

Strategic Context

The corporate mission of Harma is to be an integrated market-oriented and flexible provider of financial services. Operational excellence is considered a strategic objective, and according to business management becoming and staying a low-cost producer of flexible insurance products is a key element in the business strategy. Providing support to intermediaries and customer service quality are considered strategic objectives by the business. In 1998, Harma integrated its individual life and non-life insurance services to form one market-oriented business to provide new integrated individual insurance products and services through its intermediaries. Increasing market pressures and distribution channel demands led to the rethinking and integration of the insurance businesses. The company is currently structured according to different market groups. These market groups, represented by members on the Board of Directors, support and collaborate with eight regional offices, which form the main distribution channel of independent intermediaries.

The market groups are responsible for the development of products relating to life insurance, non-life insurance and mortgages. The market group is led by a director and is divided in four departments: policy and product development, marketing and sales, (IT) system and process support and administrative services. Each department is headed a department manager responsible for his or her departmental tasks. Every week the market leader and department managers meet to discuss different issues, resolve conflicts and negotiate solutions. Every year a mid-term market plan is developed containing the major objectives set for the coming three years. This mid-term plan is based on the corporate plan and is operationalized in a one-year plan. Mid-term plans are then communicated and coordinated within and across the business departments through mutual consultation. Each year mid-term plans are reviewed.

Information Governance Design

Information technology is a standard item on the agenda. Information technology is of strategic importance to Harma. The annual report (1999) describes IT as *"a strategic means to competitive advantage"* and indicates that *"the IT strategy is carefully aligned with the commercial and business objectives"*. However, business management indicates that it is unclear whether there is indeed a coherent IT strategy that fits in the business framework, and IT management indicates that business objectives are sometimes to vague to be able to align IT with the business. IT management argues that because of the organizational restructuring, business objectives remain too abstract, and are not clearly formulated and communicated to IT.

The IT strategy plan describes the role of IT as providing optimal support to the market groups by enabling efficient and effective business processes, improved time-to-market and improved services quality to users and intermediaries. IT strategy plans are developed by the IT organization and are derived from the market group strategy and mid-term plans. The mission of the IT organization is to deliver optimal IT support to the business in a professional manner. Professional meaning on time, within budget and according to specified functionality and quality.

The IT organization is managed by a CIO (member on the Board of Directors) and consists of three centralized departments for (a) IT consultancy, architecture and information management coordination, (b) IT infrastructure, support and services, and (c) IT system development. These departments are led by department directors and consist of different functional managers. Setting infrastructure and architecture standards between market groups, and developing shared back offices are key priorities for the IT organization. The IT systems development department is structured according to account managers (for the IT system support departments in the market groups) and competence centers (for application/system developments).

In 1998, the IT organization initiated an integrated change program to professionalize its services and organization. Pressures leading up to this change program were the new market-oriented business structure, increasing project cancellations, time and budget over-runs, insufficient professional project management and a general dissatisfaction with the quality of IT systems and services. The IT organization-wide change program focuses on introducing (a) a new organizational structure with account managers for professional relationship management with the business users; (b) system development process improvement (from CMM level 1 to CMM levels 2 and 3); (c) infrastructure

management improvement through ITIL-based management; (d) training, coaching and performance monitoring of IT personnel.

In conjunction with the implementation of the new business structure and the IT organization change program, new mechanisms for the governance of IT were planned in Harma. Up until 1998, the demand and supply of IT were regulated by the IT organization. Priorities, roles and responsibilities with regard to IT were unclear. Through the introduction of 'information management' in the business domain, the market groups are attempting to take responsibility for the demand of IT, and making the business leading and in control of IT investments and strategic developments. The information management function serves as a linking pin between the business domain and the IT organization. According to senior IT management, the information manager will need to inspire and fulfill the difficult role of translator between IT and the business. The information management functions in the different business domains are coordinated by the IT consultancy and architecture department in the IT organization.

Prior to 1997, IT investment decisions were not strictly prioritized and selected according to business necessity and relevance. Project proposals and assignments were not always clear, nor fully supported by the business and IT. There was limited analysis of costs, benefits and risks. IT was managed in a relatively ad-hoc manner, and many IT projects were driven by IT with limited involvement and understanding by the business and without clear business objectives. According to senior IT management, there were too many projects, there was no clear structure, and there was no real involvement or commitment from business management.

As stated by a senior business executive: *"We have a culture of starting immediately, building everything at once, and working our way out of problems. Still too often we want too much too fast, without considering the complexity and risks involved. As a consequence we loose sight of the real business relevance, the organizational impact and scope. We still need to keep a tight lid on the scope of our IT endeavors".*

Business management indicates that IT has little feeling for the real business issues and they often do what pleases them, arguing that *"IT always comes up with the newest ideas and gadgets, but whether it is desirable, necessary and relevant to the business is not always clear".*

In response to the unsatisfactory ad-hoc management of IT, Harma organized steering groups and project management structures. The steering group is chaired by a business sponsor, often a member on the Board of Directors, who is responsible for the budgets and realized benefits of the project. This group consists of business directors, department managers, IT managers and the project manager. The rationale for setting up steering groups was to get senior and business management more involved in the IT initiatives.

Steering groups meet each month to discuss project plans and progress. Reports are written and discussed in formal meetings. The content of these reports describes commercial, organizational, personnel, administrative, financial, information and technical (COPAFIT) issues. According to the plans, project progress is managed according to budget, organizational, time, informational and quality measures. However, the practice in Harma reveals that the intake and planning of projects is not always COPAFIT wide, and budgets and timelines are the actual measures used for managing projects. Business management indicates that still too often there is a focus on budgets and costs, with not enough attention paid to added value to the business and changes that need to take place in the organization in order to benefit from IT. On the other hand, IT management indicates that "*the problem originates in the very first phase of the project definition when we don't have the guts to say that the project objective isn't right or clear enough. Because of commercial pressures we still follow through, hoping for a 'quick win'.*"

Project prioritization and selection are not always formalized and are mostly budget and cost oriented. Business management indicates that *"it is a matter of who can scream the loudest and has more power. Often there are 'pet projects' that receive more attention. As projects progress, new demands and user needs are communicated to IT and these are then included without rechecking the plans. This leads to frustrations and disappointment for both parties and this situation remains regrettably unchanged".* According to business management a strategy on how to manage IT is missing.

The project manager, usually appointed from the IT organization, or sometimes recruited externally, is responsible for the managing the project organization and the different sub-project managers. Each project organization has different sub project leaders who are responsible for a functional area within the project, e.g., user requirements and functionality, IT system design and development, and organizational change and implementation. Formally, the project managers and leaders meet every week to discuss plans and progress. Informally there is bilateral communication between project management and project leaders

However, according to project management *"in practice there is still a feeling of 'us against them', and project reports are too often informal and not always according to the agreements"*. Business management also indicates that progress reports are of low quality and documents are not always complete or in writing.

According to senior IT management, steering groups are no longer steering, but discussing the technical details of the project: *"The roles, responsibilities and relevance of projects is not always clear, and too often conflicts arise between business and IT. As a consequence, we have endless discussions that result in budget and time overruns and low functionality"*.

In response to the external commercial pressures and internal unsatisfactory management conditions, Harma institutionalized program management in 1998 for the selection, control and evaluation of IT projects. Under responsibility of the CIO, the program management office is responsible for selecting, controlling and evaluating IT projects with regard to the overall compatibility with the company strategy and business (market group) plans.

Based on Information Economics and Balanced Scorecard methods, the program management office selects and prioritizes projects in alignment with the business objectives, hereby taking into account the IT budget that was specified by the Board of Directors. Every year a project calendar is developed and performance measures defined. Projects are evaluated on a quarterly base by the Board of Directors, and monthly by business directors and project managers.

The program manager indicates that *"identifying objectives and performance measures is easy, but agreeing on these objectives and measures across business and IT, and the different management levels is tricky. Different parochial cultures exist with different interests and we need to break through these mental barriers. It's a learning process that takes time, effort and commitment"*.

Strategic Outcome

Internal company documents describe IT as a strategic enabler of improved business processes and insurance products. Senior executives and business management, however, indicate that in practice IT is more of an inhibitor than an enabler. Except for few individual successful projects, more than half of the IT initiatives fail to meet time, cost, quality, and functional requirements. Many IT projects still run over time and budgets limits, do not meet functional requirements or business objectives, and users are largely unsatisfied. An internal memo indicates that the Board of Directors is not satisfied with the performance of the IT systems.

While IT management reports that the costs of IT have dramatically risen, business management indicates that there is little added value to the business. According to business management *"while IT may have reduced costs to some extent, the real value for our business and customers, in the form of improved products and services, remains difficult to achieve"*.

Improved time-to-market, flexible systems, and service innovation are key objectives, which according to business management *"have not improved significantly from the investments in IT"*. Furthermore, because of the legacy and complexity of systems, systems quality and IT flexibility are perceived as low and insufficient.

On average both business and IT managers rate the business value of IT with a '5' (on a scale from 1 to 10). A recent IT strategy plan states that *"Our company is not getting the expected value for money from investments made in IT"*. According to IT management this has led to a negative image of IT in the business organization. Both business and IT mangers are largely dissatisfied with the governance and performance of IT and indicate that *"as 'IT governors' we still need to learn to govern IT effectively"*.

Appendix O - Pyrasus

Strategic Context
Pyrasus is a large insurance company, consisting of a staff of over 2500. Pyrasus offers a complete range of personal and commercial insurance products through a branch network and call center of a bank. The primary value propositions in Pyrasus are product leadership and operational excellence. The strategic objectives of the Pyrasus are to improve the effectiveness and efficiency of the different distribution channels, the commercialization of products, and the responsiveness to market developments and customers. Optimizing business processes and improvements in image are likewise key business objectives. The launch of new forms of insurance, as well as the stronger focus on insurance in the branch network, has made a significant contribution to the growth of Pyrasus. Collaborative synergy and customer value are also regarded as important secondary value propositions, recognized in business objectives of customer responsiveness, customer convenience, the search for functional and business unit collaborations.

The business organization of Pyrasus is characterized by a decentralized structure with profit responsibilities at the business-unit level. The organization is structured according to four lines of business, i.e., life, P&C, corporate and individual consumers, and corporate departments (central staff) for Finance, Human Resources, and Information Technology. Life and P&C insurance are the main lines of business within Pyrasus. A director of business and a management team lead each of the business units. The directors of business report directly and regularly to the Board of Directors, consisting of a CEO, CFO and CIO.

Every four years a long-term strategic plan is developed, and every year a plan for operational activities is drawn together. Strategic planning activities include both formal meetings between the board and directors, as well as informal meetings 'on' and 'off' the job. Short-term operational plans are derived from the long-term strategic planning. These plans include elements of marketing, insurance operations and IT, and are developed iteratively between the different central and decentral departments. According to the business director, this provides Pyrasus with both a strong feeling for direction and the ability to respond to current develops. *"Even if it isn't included in the strategic plans, the operational plans gives us the freedom to jump in when we see an opportunity"*, according to the business director. Each year the operational plans and performance are evaluated in light of the long-term strategic plans.

Information Governance Design
Pyrasus is heavily dependent on information technology, and IT processes form the basis for major insurance products and services. According to IT management, new distribution channels such as call centers and the Internet are being used, and a corporate IT architecture for the multi-channel platform has recently been implemented. The integrated supply of information through the distribution networks is of strategic importance to Pyrasus. The vision of IT as a strategic enabler of improved business performance, and process and product innovation is shared by both the business and IT. According to the business director, continued investments in IT are seen as critical requirements in sustaining a competitive position.

At the corporate level, the IT strategy is concurrently developed with the strategic business plans, in which the strategic objectives for IT are formulated. The strategic IT objectives are then translated into strategic programs consisting of several IT projects, which are related to the short-term operational plans of the business. Strategic and operational business and IT plans are discussed in both formal and informal meetings between business and IT managers. Management workshops often serve as a preferred format to discuss the role of IT in new business developments. Special attention is placed on the alignment of corporate, business and IT strategies, which are frequently developed and assessed through scenario analysis and IT vision workshops.

The value proposition of the IT organization is formulated as *"the delivery of high-quality IT products and services to enable the business to perform efficiently and innovate effectively"*. An important task of the IT organization is to ensure that by pursuing innovative strategies and implementing architectures and systems, the business units will be better able to utilize their IT resources in order to provide added value to the final customer. Strategic issues for the IT organization concern flexibility, time-to-market, continuity, efficiency and reliability of services. Flexibility and availability at

minimum costs are strategic drivers for the IT organization. The CIO indicates that in order to realize the mission statement of the IT organization, strategic partnerships between the IT department and the lines-of-business in Pyrasus is pivotal. According to business management, *"a sound relationship with the IT organization is crucial for realizing our business objectives. IT is so embedded in our processes and products, that we need quick and open channels with the IT management"*.

IT management indicates that this was not always the case. *"Prior to 1996, business and IT were living in silos, and everyone did their own thing. By the end of 1995, the business changed its strategy and started to focus more on new forms of insurance and delivery. Product innovation, customer responsiveness and time-to-market became, and are still key business objectives. This changed the way we dealt with the business. Before 1996, we were predominantly focused on operational efficiency and optimizing business-workflows. In 1996, there was a clear shift at getting more involved with the business. Today, we are part of the business"*.

In the period following 1996, Pyrasus made several changes to the organization and management of IT, focusing on the professionalization and formalization of the integration of business and IT. Changes that were implemented by a business-IT taskforce included the standardization of IT investment management - mandatory prioritization, selection, and evaluation through a balanced scorecard -, with a strong emphasis of bottom-up input from business-units and business directors; and the formalization of IT operations and support through the adoption of SLAs (Service Level Agreements) and ITIL-methods (IT Infrastructure Library).

The IT organization was restructured into several core units for corporate IT architecture, corporate IT development, corporate IT operations and corporate IT support. Relationship management was implemented focusing on account management, solution integration, and portfolio management. Executive committees and strategic IT forums were institutionalized at both the corporate and business-unit level for guiding IT decision-making processes and steering business-IT programs and business-IT projects. IT training and job-transfer programs were implemented, and a shared project database was developed. Business and IT managers followed a training program for project and program management, and a center for expertise in project management was developed. The business directors and IT managers also attended workshops on using the new balanced scorecard method for managing IT investments.

Decision-making authority for IT innovation and development was decentralized to the business-units, in which the business director now took responsibility for IT-related business development and innovation. The business director was entrusted with commissioning new business developments with a strong IT component. Prior to 1996, the IT organization led business-IT projects. A senior IT management indicates that *"with the emphasis on process and product innovation in the business, it was crucial that the business was in charge of IT decision-making for business developments"*.

Currently [2000], a structured multi-level organization consisting of business and IT constituencies, at both corporate and business-unit levels, describes the governance of IT at Pyrasus. At the corporate level, the central IT organization responsible for, and makes strategic decisions regarding IT infrastructure, including, IT operations, IT networks, and IT support. An executive committee is responsible for allocating and evaluating corporate-wide IT investments. Senior business and IT management participate in the executive committee, and meet once every two weeks. Besides formal meetings, informal bilateral communication frequently occurs. An IT advisory steering group is responsible for discussing specific IT-content issues, in which specific IT domain professionals participate.

At the business-unit level, business management is responsible for, and makes strategic decisions regarding business-IT developments, whereas BU-IT management is responsible for decisions regarding IT applications. IT management indicates that whereas they are responsible for IT applications, problems and solutions regarding IT applications are often discussed in management team meetings. IT developments are managed through a project organization, which is headed by a management team, led by the business director. In the case of large, strategic IT projects, a steering committee is organized consisting of senior business and IT managers. The project organization consists of business managers (responsible for product development, market development, user training, and product implementation), and IT managers (responsible for systems design, development, support). The project IT manager is supported by the relationship manager.

Strategic Outcome
Regarding the business value of IT, corporate and business management indicate that IT has enabled numerous changes and improvements in the organization, including, improved time-to-market, innovation in products and distribution channels, reduced transaction costs, sustained market growth, and improved customer satisfaction. Business and IT stakeholders are very satisfied with the business value appropriation from IT, and rate this with an '8'.

IT development performance in Pyrasus is assessed by looking at targets set for time, budget, functionality and quality. The realization of these targets is assessed on a yearly basis, based on the project evaluations that take place. In general, the trend over the past 2 years [1998 – 2000] has been one of improved IT performance. According to business and IT management, projects are usually finished on time, within budget, and systems are of high functionality and quality. Business management indicates that over 75% of the system development projects carried out meet functional and quality requirements.

With regard to IT operations and support, business and IT management indicate that availability of IT systems and the responsiveness of the IT organization is very good. Internal IT audits confirm high availability and responsiveness. IT management indicates that with the formalization of the IT service management, and the implementation of the corporate IT architecture, the performance of IT operations and the networks is of high quality.

A senior IT manager states *"A lot has changed in the past four years. Our organization has become more professional at providing IT solutions, and partnering in business development. This doesn't mean that we don't experience any problems, or that there aren't any conflicts in the organization. These still occur, but at least we know now how to deal with these issues, and channel our expertise and skills to the resolution of problems".*

Appendix P - Sparta

Strategic Context

Sparta is part of an internationally and domestically operating financial services organization, and provides both banking and insurance products through its network of interconnected branch offices. The organization has a working force of over 5000. The corporate strategy of Sparta is to position itself as a provider of integrated banking and insurance products and services, and the creation of a broad range of insurance products linked to banking products. Sparta aims to supply a comprehensive and high-quality range of banking and insurance products. The focus is on the customer with their unique financial situation, wishes and requirements. Operational efficiency and effectiveness, product innovation, service quality, and added value to the customer are key business objectives.

Sparta is organized around distinct, but interrelated financial businesses: (i) Sales, (ii) Insurance, and (iii) Credits and Finance. Over the past years, Sparta has developed towards a market-oriented customer-centered organization, focused on improving market and customer responsiveness. The responsibility for customer satisfaction, market share, profitability and quality of the internal organization lies with the local business organization. *Sales* is responsible for providing corporate and personal customers with banking and insurance products and services through a market-oriented network of about different branches organized in several districts. *Credits and Finance Business* is responsible accepting, managing and monitoring individual risks and credit risks. *Commercial Development Business and Insurance* is responsible for the development of dedicated products, service concepts and commercial campaigns and, in addition, lends marketing and product support to the sales organization. The organizational structure is built on identifiable client groups and products.

A portfolio committee, in the form of a management team, is responsible for steering and providing direction to the business. Senior managers of the different lines-of-business participate in the portfolio committee. The yearly planning and control cycles have been largely abandoned. In the current organization, business development proposals are discussed in the committee, and realized through a project-based working structure. The committee is responsible for selecting 'promising proposals', allocating budgets, and evaluating the outcomes. The committee consists of top-management and directors of different departments, supported by a project office. The project office aids the committee in managing, budgeting and controlling a portfolio of projects. The aim of the project office is to professionalize the project-based structure and the leadership of project-based working.

Information Governance Design

The mission statement of the IT organization is to deliver competitive IT products and services efficiently and effectively, enabling the business to operate successfully. An important task of the IT organization is to ensure that by pursuing strategies, architecture and systems, the organization will be better able to utilize its IT resources in order to provide added-value. Strategic issues for the IT organization concern business-IT alignment, product time-to-market, continuity and reliability of information services. Flexibility and availability at minimum costs are key incentives and drivers of the IT organization.

In order to realize the mission statement, close collaboration between the IT organization and the lines-of-business in Sparta is considered important. Sparta is heavily dependent on IT, and IT processes form the basis for major banking and insurance products and services. According to IT management, the malfunction of a critical IT system can threaten the continuity of the processes and services. IT is also of strategic relevance for business development. New distribution channels, such as call centers and the Internet are used to cater to the needs of customers. The integrated supply of information through the distribution networks is of strategic importance to Sparta.

In 1995, a research project was conducted on the effectiveness of the IT function in Sparta. The most important conclusions were: (i) limited business-IT alignment; (ii) low time-to-market; (iii) unresponsive IT organization; (iv) unclear IT investment management processes; (v) limited business value from IT. The findings resulted in a program for restructuring the IT function, containing the following organizational changes: (a) Transparent and integrated IT investment management process; (b) Standard procedure for prioritizing and selecting in IT project investments; (c) Business and strategic IT forums at both corporate and business levels; (d) Mobilization and involvement of business and IT management at all levels; and (e) New IT functions -Corporate IT, Development, Operations

and Support- to improve the efficiency, effectiveness, responsiveness and overall quality of services and products. These changes have been successfully adopted by the IT organization.

The IT organization is structured according to a number of functions for corporate and line-of-business purposes, each containing certain IT responsibilities. The corporate IT organization is led by a CIO, who is a member of the top-management team. The different centrally organized IT functions include: (i) Corporate IT, (ii) Corporate Functions, (iii) Corporate Networking, (iv) Operations, (v) Support, and (vi) Development. Each functional unit is managed by an IT unit director. The corporate IT organization is responsible for formulating the IT strategy and architecture for Sparta.

Corporate and Business IT forums exist in which IT strategies are discussed and developed. A special task of this corporate unit is to research the new possibilities of IT and to promote the use of the promising IT developments. Special attention is placed on the alignment of corporate, business and IT strategies, which are frequently developed and assessed through scenario analysis and vision workshops. Another important responsibility of this unit is the co-ordination of centers of expertise within Sparta. It serves as a 'knowledge broker' for Sparta. A Lotus-Notes based network is used the exchange and share information.

The corporate IT organization is also responsible for developing company-wide systems. In particular this involves Electronic Banking systems for private and business sector products such as loans, mortgages, savings, and insurance, but also call centers and office systems. Divisional IT development is, however, decentralized to the different strategic business units within Sparta. Relationship Management, Resource Management and a Project Office are used to coordinate corporate IT developments and divisional IT developments.

Relationship management involves three tasks: (a) account manager for internal customers, (b) solution integrator for IT architecture, and (c) portfolio manager for IT projects. IT management indicates that the greater proportion of time is spent on managing IT projects and IT project leaders that participate in business projects. Resource management involves a 'pool' of IT personnel that are involved in IT development and IT maintenance activities. IT personnel are grouped into different 'resource groups'. The project office provides 'pro-active' support to project management in the planning, organization and evaluation of projects. Its function is similar to that of the project office in the business environment. Quality control plays an important role in the project office activities, and specific (computer-based) project management tools are used.

At top-management level, a portfolio committee is responsible for prioritizing, selecting, allocating and evaluating IT investments. Senior business and IT management participate in the portfolio committee, and meet once every two weeks. Senior top management chairs the committee. Besides formal meetings, informal bilateral communication frequently occurs. An IT advisory steering group is responsible for discussing specific IT-content issues, in which specific domain professionals participate.

Business demands for IT are formulated by the business organization and are the responsibility of senior business manager. Senior business management is the main sponsor of a business-IT initiative. The sponsor is responsible for the financial and human resources of the project. These business-IT initiatives are realized through a project-based working structure. The sponsor reports directly to the portfolio committee. Reports include the end-results, utilized resources, budget, and time. Reporting is based on exception, when the project is fundamentally deviating from plans and progress.

The project organization is led by a project management team consisting of a project manager, a business project leader and an IT project leader. The project management team meets every week to discuss plans, progress, and problems that may arise. Informal meetings between managers take place on a regular basis. Content, quality, time, and budget of the project, are standard items on the meeting agenda. The project manager is responsible for managing business and IT project leaders and delivering the specified requirements. Project managers are usually full-time dedicated to the project, and are allocated from within the business organization. The project manager reports directly to the sponsor.

The business project leader is responsible for the sub-projects product/market development, product acceptance and product implementation. User-training is also a responsibility of the business project

leader. The business project leader is responsible for managing all of the project-related business resources. The business project leader reports directly to the project manager.

The IT project leader is responsible for sub-projects within the IT domain, and manages all related project resources. IT development and delivery are key responsibilities of the IT project leader. Support and Operations tasks also are part of the responsibilities of IT project leader. The IT project leader reports directly to the project manager. Business management argues however: "*Sometimes I still experience two ships with two captains. IT sometimes still runs its own business without informing me. The task of IT project leader is inherently linked to the person; some people are just better than others. If IT makes a wrong decision, I have to report it to the sponsor and committee. While I am held accountable, I have little control over what IT decides*".

Supporting the IT project leader and project manager is a portfolio manager. The portfolio manager is account-responsible for a particular domain within the IT organization. Portfolio managers provide an estimate of development and maintenance costs, and advises on IT architecture requirements.

Sparta employs a standardized phased approach for IT decision-making, and different stakeholders and methods are involved in IT activities. These activities are embedded in and supported by the structural mechanisms. The phased approach for IT decision-making involves seven, more or less formalized, activities: (i) Idea generation; (ii) Scanning; (iii) Proposal Assessment; (iv) Project organization; (v) System development; (vi) Implementation; and (vii) Evaluation. These seven activities are driven by the business, and led by the business organization, with the involvement of IT management.

Idea generation involves some external or internal need. This can address an opportunity (e.g. new product) or an obstacle (process inefficiency). Anyone within Sparta can submit an idea to the portfolio committee. "*Very often this idea is based on a hunch or gut feeling, but sometimes also on a concrete problem*", according to business management.

If the portfolio committee agrees with the idea, resource capacity for both business and IT are allocated, and within three weeks, a team of business and IT managers are required to 'scan' the idea more in-depth. This 'scan' includes an analysis and description of the strategic relevance, the customer orientation, the competitive need, and the costs, benefits and risks of the new development. There is a standard protocol for conducting the scan. The portfolio committee addresses and assesses these items, and advice is provided.

Following the scan and acceptance by the portfolio committee, a project proposal is written by the project manager, the business project leader and the IT project leader. The items addressed in the scan are described and the project organization, project management, financial and human resources, business and IT capacity are included. There is a standard format for describing the project proposal, and the total process takes approximately six weeks. Business management indicates that "*much lobbying goes on for getting projects accepted by the committee. This is part of the game*".

If and when the portfolio committee accepts the project proposal, the project is organized and project activities are commenced. This includes arranging the support facilities of the project (e.g., location), contracting, resourcing, and allocating responsibilities and accountabilities.

The IT decision-making and management process is completed with a formal evaluation of the project organization and deliverables. The aim of the evaluation phase is to learn from past experiences for future initiatives. The evaluation includes a number of categories, including: realized budget and time-lines, required functionality, organization and management, realized quality, utilized methods and techniques, satisfaction, and specific (positive and negative experiences) lessons and learned. The project office reports the results of the evaluation to the managers involved. Monthly presentations and workshops address the key lessons learned in specific projects. Trends and particularities are addressed.

Strategic Outcome

IT performance in Sparta is assessed by looking at targets set for time, budget, functionality and quality. The realization of these targets is assessed on a yearly basis, based on the project evaluations that take place. In general, the trend over the past 3 years is one of improved IT performance. More than before, projects are finished on time, within budget, and the systems are of high functionality and quality. Business management indicates that over 80% of the system development projects carried out

meet functional and quality requirements. IT management admits though that sometimes these projects do run over time and budgetary limits. "*Effectiveness still comes at a high price*", IT management argues, but "*business functionality is holy*". With regard to infrastructure services, senior IT management and business management indicate that Sparta rates very good on availability. Internal IT audit reports indeed confirm high availability (99.9%) and high responsiveness (98.6%).

Senior IT management states "*IT contributes significantly to business value, but there is no standard evaluation mechanism for assessing whether commercial-business objectives are actually realized. IT is so complex and intertwined with business processes that it is difficult to quantitatively assess the business contribution of IT*".

Business and IT managers do however identify the following contributions of IT arguing "*without IT, these improvements and added-value would not have been possible*":

- increased time-to-market and flexibility;
- improved product innovation;
- improved distribution channels;
- reduced transaction costs;
- sustained market growth;
- improved customer satisfaction;
- improved business flexibility;

On average business and IT management are satisfied with the performance and business value of IT, with a self-rating of an '8.5' (on a scale from 1 to 10). Business and IT management indicate that "*while there is no question that IT is of added value to our products, services and processes, we are not a perfect '10'. We still need to learn to manage IT more efficiently. We have come a long way in breaking down the 'Chinese walls' that existed between business and IT in the past*".